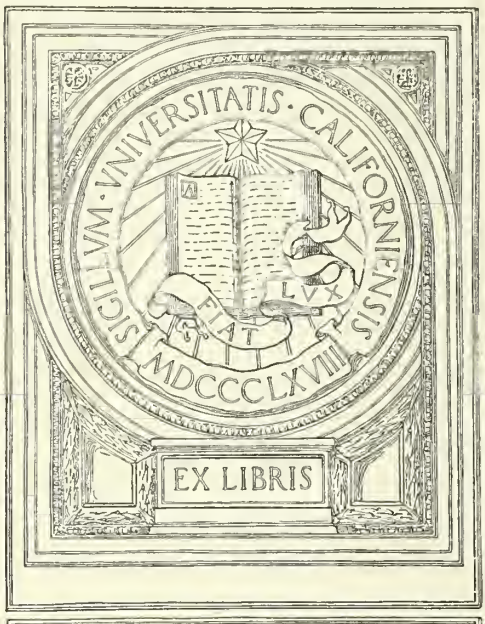
MEDICAL SCHOOL
LIBRARY



Digitized by the Internet Archive
in 2016

https://archive.org/details/minnesotamedicin26unse

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society

---

Owned and Published by
THE MINNESOTA STATE MEDICAL ASSOCIATION
Under the Direction of Its

EDITING AND PUBLISHING COMMITTEE

E. M. Hammes, M.D., Chairman, St. Paul
T. A. Peppard, M.D., Secretary, Minneapolis
A. H. Wells, M.D., Duluth
H. A. Roust, M.D., Montevideo
C. L. Oppegaard, M.D., Crookston
Philip F. Donohue, M.D., St. Paul
Henry L. Ulrich, M.D., Minneapolis
O. W. Rowe, M.D., Duluth
H. W. Meyerding, M.D., Rochester
B. O. Mork, Jr., M.D., Worthington

EDITOR
Carl B. Drake, M.D., St. Paul

ASSOCIATE EDITORS
George Earl, M.D., Saint Paul
Henry L. Ulrich, M.D., Minneapolis

UNIV OF CALIF
MEDICAL SCHOOL

VOLUME 26

JANUARY TO DECEMBER, 1943

EDITORIAL AND BUSINESS OFFICES
2642 University Avenue - - - - - - - - - Saint Paul, Minn
BUSINESS MANAGER
J. R. Bruce

UNIV OF CALIF
MEDICAL SCHOOL

INDEX TO VOLUME 26

A

Abdominal injuries, 529
A and B substances, Plasma and serum toxicity due to, 1056
Abdominal pain, 61
Abnormal uterine bleeding in adolescence, 961
Acute obstruction of the bowel, 1009
Acute suppurative otitis media—a reconsideration, 257
Adson, Alfred W.: Evolution of neurosurgery, 66
Adson, Alfred W.: The doctor of medicine and his responsibility, 352
Adson, Alfred W., and Baker, George S.: Treatment of craniocerebral injuries in modern warfare, 282
Adults, normal, Nutrition in, 610
Advances in radiology in the past quarter-century, 87
Aerophagia, 350
Aged, General care of the, 876
Aged, Nutritional management of the, 881
Aged, Surgical treatment of the, 884
Agranulocytosis associated with sulfadiazine therapy (case report), 898
Allergy, extreme, to bee body and bee venom, Successful treatment of (case report), 1061
Allison, R. G.: Advances in radiology in the past quarter-century, 87
Anesthesia, intravenous, Newer trends in, 349
Anesthesia, Spinal—important principles, 346
Anesthesia, spinal, Neurological complications associated with, 339
Anesthesiology, Twenty-five years of "Minnesota Medicine" and of, 57
Anesthetic, spinal, Injury to spinal cord and meninges from (abstract only), 491
Aneurysm, Congenital arteriovenous (case report), 627
Animals, Virus diseases of, 604
Appendicitis, acute, Nonclosure of wounds in, and the use of the Gibson-Mickulicz tampon, 651
Appendicitis, Pain as a symptom in, 622
Arbeiter, Herbert I., and Levine, Milton Gjelhaug: Reinfection with pneumococcus meningitis (case report), 1065
Arteriovenous aneurysm, Congenital (case report), 627
Arthur, Grace: Delayed speech from the standpoint of a psychologist, 369
Aseptic gastric resection for ulcer and carcinoma, 833
Athens, A. G.: Visual malingering, 266
Atypical pneumonia, 337
Auricular fibrillation, Pathologic changes in the auricles in, associated with hypertension, 699

B

Baker, A. B., and Kamman, Gordon R.: Damage to the spinal cord and meninges following spinal anesthesia—a clinico-pathological study, 786
Baker, George S., and Adson, Alfred W.: Treatment of craniocerebral injuries in modern warfare, 282
Baker, Jeannette: Preparing the child for school, 1041
Barnes, Arlie R.: Recent advances in our knowledge of coronary sclerosis and its bearing on the clinical management of patients, 863
Barron, Moses: The medical management of peptic ulcer (abstract), 205
Baxter, Stephen H.: The physician in civic life, 521
Bee body and bee venom, Successful treatment of extreme allergy to (case report), 1061
Bell, C. Curry: Compression fractures of the spine, 687
Beneficial effect of urea in topical sulfonamide therapy, The, 276
Benjamin, A. E.: Acute obstruction of the bowel, 1009
Biceps brachii, Rupture of the long head of the, 834
Biceps muscle of the arm, Rupture of the long head of the, 836
Bile, White, 955
Bleeding, Abnormal uterine, in adolescence, 961
Blood count, routine, in the newborn, Practical applications of a, 779
Blood, The discovery of the pulmonary circulation of the, 1054
Blumenthal, Jacob S., and Wetherby, Macnider: Vitamin A in the treatment of hypertension, 370
Boehrer, John J.: Nutrition in normal adults, 610
Boleyn, E. Sydney: Reminiscences, 99
Bowel, Acute obstruction of the, 1009
Boyd, W. L.: Virus diseases of animals, 604
Boynton, Ruth E.: Diagnosis of early tuberculosis among University students, 439
Bratrud, Arthur F.: Nonclosure of wounds in acute appendicitis and the use of the Gibson-Mickulicz tampon, 651
Bratrud, Theodor E., and Flink, Edmund B.: Agranulocytosis associated with sulfadiazine therapy (case report), 898
Bronchial occlusion, Roentgenologic observation on (abstract), 1097
Brown, W. H., and Jenkinson, E. L.: The differentiation of endometriosis and carcinoma of the sigmoid colon, 773
Brucellosis, Chronic or recurrent, 568
Bulkley, Kenneth: Unusually severe facial injury, 737
Burch, Frank E.: Malignant melanomas of the uvea and their prognosis, 208
Burns, Treatment of, 534

Book Reviews

American Medical Association: Reports of the Council on Pharmacy and Chemistry, 750
Anderson, Dwight, and Baylous, Margaret: When doctors are rationed, 313
Anderson, W. A. D.: Synopsis of pathology, 397
Barzilai, Gemma: Atlas of ovarian tumors, 498
Brawner, James N.: The mind and its disorders, 221
Colwell Publishing Co.: Dr. Colwell's daily log, 1022
Compere, Edward L., and Banks, Sam W.: Pictorial handbook of fracture treatment, 1106
Geist, Samuel H.: Ovarian tumors, 397
Hamilton, Burton E., and Thomson, K. Jefferson: The heart in pregnancy and the child-bearing age, 297
Herrold, Russell D.: Chemotherapy of gonococcic infections, 497
Jackson, Arnold S.: The answer is—Your nerves, 220
Kilduffe, R. A., and DeBakey, Michael: The blood bank and the technique and therapeutics of transfusions, 221
Levine, Maurice: Psychotherapy in medical practice, 313

Lewis, George M., and Hopper, Mary E.: An introduction to medical mycology, 1104

Putnam, Tracy J.: Convulsive seizures: how to deal with them, 749

Rigler, Leo G.: Outline of roentgen diagnosis, 1106

Squibb, E. R., & Sons: Monograph on lymphogranuloma venereum, 1104

Stern, Edith M., with collaboration of Hamilton, Samuel W.: Mental illness: A guide for the family, 498

Strecker, Edward A.: Fundamentals of psychiatry, 396

Tassman, I. C.: The eye manifestations of internal diseases, 220

Titus, Paul: Atlas of obstetric technique, 1022

Trueta, J.: The principles and practice of war surgery, 667

Year Book Publishing Co.: The 1942 Year Book of general medicine, 313

C

Calvin, Arthur M.: Group hospitalization, 104

Camp, Walter E.: Prognosis of malignant melanomata of the uvea from the standpoint of pathogenesis, cytology and fiber content, 210

Carcinoma, Endometriosis and, of the sigmoid colon, The differentiation of, 773

Carcinoma of the lung, 1046

Carcinoma, Primary bronchiogenic, 90

Carcinoma, ulcer and, Aseptic gastric resection for, 833

Carey, James B.: Changes in the gastric mucosa related to disease, 656

Carroll, W. C.: A deodorant for colostomies, 709

Changes in the gastric mucosa related to disease, 656

Chatterton, C. C.: Fractures of lower end of radius and ulna, 697

Chest conditions simulating tuberculosis, 430

Child, Feeding the, 1039

Child, Preparing the, for school, 1041

Children, Emotional disturbances of, in wartime, 1044

Chronic or recurrent brucellosis, 568

Cilia, Loss of, in the respiratory tract and its relation to death from respiratory diseases, 272

Circulation, pulmonary, of the blood, The discovery of the, 1054

Civic life, The physician in, 521

Clagett, O. Theron: Surgical treatment of the aged, 884

Clark, William G., and Strakosch, Ernest A.: The beneficial effect of urea in topical sulfonamide therapy, 276

Collapse therapy in treatment of pulmonary tuberculosis, 428

Collins, Arthur N.: Transurethral resection, 782

Colon, sigmoid, The differentiation of endometriosis and carcinoma of the, 773

Colostomies, A deodorant for, 709

Common duct repair by means of a vitallium tube (case report), 1064

Compression fractures of the spine, 687

Congenital arteriovenous aneurysm (case report), 627

Conjunctivitis, Staphylococcic, 263

Connor, Charles E.: Acute suppurative otitis media—a reconsideration, 257

Corneal lesions, The diagnosis of, 243

Coronary disease, 33

Coronary sclerosis, Recent advances in our knowledge of, and its bearing on the clinical management of patients, 863

Coventry, W. A.: The progress of obstetrics during the past twenty-five years, 84

Craniocerebral injuries in modern warfare, Treatment of, 282

Crow, E. R.: Chest conditions simulating tuberculosis, 430

Crowell, Bowman C.: The influence of war on medicine, 795

Culligan, John M., and Soltman, D. Jack: Trauma of the spleen, 710

Culligan, L. C.: Aseptic gastric resection for ulcer and carcinoma, 833

Curare, Use of, in metrazol treatment of psychoses, 1052

Cysts, Enterogenous, of the rectum, 1008

Clinical-Pathological Conference

Acute degeneration of the liver; bronchopneumonia; acute esophagitis; jaundice, 106

Acute jejunal diverticulitis; generalized peritonitis; bronchopneumonia, 191

Aneurysm of arch of aorta; syphilitic aortitis; bilateral bronchopneumonia, 1003

Carcinoma of papilla of Vater; jaundice; gastric and duodenal ulcers; urethral stricture; bilateral hydronephrosis; syphilitic aneurysm of aorta, 897

Carcinoma of rectum with metastasis to liver; edema of lungs; bilateral hydrothorax, 715

Chronic equine encephalitis, 445

Chronic glomerulonephritis; solitary kidney; uremia; congenital absence of uterus, Fallopian tubes and vagina; bronchopneumonia, 289

Chronic lymphatic leukemia; chronic atrophic gastritis; macrocytic anemia, 1061

Essential hypertension with uremia; congenital polycystic kidneys; multiple cerebral hemorrhages; hypertrophy of heart; bronchopneumonia, 626

Lobar pneumonia; old valve defects; acute bacterial endocarditis; adherent pericardium; coarctation of the aorta, 372

Mycosis fungoides with involvement of skin, right lung and liver; bronchopneumonia; right hydrothorax, 544

Tuberculous pericarditis with effusion; bilateral pulmonary tuberculosis; chronic passive congestion of liver; adenomatous goiter; old tuberculous arthritis of left hip; scoliosis of lumbar spine, 804

Communications

Cahal, Mac F., 1088

Garland, L. Henry, 1088

Pryor, Mrs. Genevieve J., 134

Rigler, Leo G., 1087

D

Damage to the spinal cord and meninges following spinal anesthesia—a clinico-pathological study, 786

Davis, William: Medicine in Minnesota sixty years ago, 97

Deafness, Eustachian tube function and, 250

Delayed speech from the standpoint of a psychologist, 369

Deodorant for colostomies, A, 709

Development of clinical pathology as a specialty, The, 52

Diagnosis of corneal lesions, The, 243

Diagnosis of early tuberculosis among University students, 439

Diehl, Harold S.: The procurement and assignment service for physicians, dentists and veterinarians, 419

Differentiation of endometriosis and carcinoma of sigmoid colon, The, 773
Diphtheria, measles and scarlet fever, Modern methods of control for, 167
Discovery of the pulmonary circulation of the blood, The, 1054
Diverticulum, Meckel's, 655
Doctor of medicine and his responsibility, The, 352
Donelson, Eva: Food preparation and preservation, 616
Dry, Thomas J., and Stover, Lee: Pathologic changes in the auricles in auricular fibrillation associated with hypertension, 699
Duct, Common, repair by means of a vitallium tube (case report), 1064

E

Early treatment of injuries to the face and neck, The, 619
Ectopia cordis, 182
Ectopia cordis abdominalis, Embryology and genetics in, 184
Embryology and genetics in ectopia cordis abdominalis, 184
Emotional disturbances of children in wartime, 1044
Endocrinology in the last quarter of a century, 43
Endometriosis and carcinoma of the sigmoid colon, The differentiation of, 773
Enterogenous cysts of the rectum, 1008
Eosinophilia, Transient infiltration of the lung parenchyma associated with (discussion only), 491
Episiotomy, 539
Erythroblastosis fetalis, Problems encountered in explaining certain cases of, on the Rh theory, 1057
Eustachian tube function and deafness, 250
Evolution of neurosurgery, 66
Experiences with the Rh substance in transfusion reactions, 980
Eye, Tuberculosis of the, 161

Editorial

A.H.A. and the A.M.A., The, 907
Accidental drownings, 638
Additional food for patients, 726
AMA legislative activity, 382
American Medical Association, Council on Medical Service and Public Relations—Statement of general policies, 1080
Barbiturate prescriptions, 999
Blalock, Alfred, 383
Buy war bonds, 383
Capitalism desirable, 297
Compensation for occupational diseases, 637
Congress and socialism, 812
Danger from fluoroscopy, 558
Diagnosis of multiple myelomata, The, 296
Doctor, save our mileage, 198
Early days, 116
Ertron, 1079
Fingerprinting of medical students and physicians, 909
Greetings from the Medical School, 116
Health and accident insurance policies, 910
Hospital insurance, 1080
Improvement in mortality statistics, 118
Incidence of syphilis, The, 118
Maternity and infant care for wives and sick infants of enlisted men, 725
Medical curricula, 1079
Minnesota evaluation serology study, 1081
Minnesota Public Health Association, The, 814
More doctors needed for armed forces, 557
Muscle coördination and endurance, 908
Neuberger—The medical historian, 1078
New Council on Medical Service and Public Relations, The, 636
Orders for industrial nurses, 999
Orr treatment of compound fractures, The, 381
Penicillin, 1077
Pneumonia today, 381
Poliomyelitis and epidemic meningitis, 909
Propamidine, 454
Red Cross, The, 297
Spanish and Portuguese in medical schools, 455
Spontaneous pneumothorax, 813
State meeting, 454
State meeting in retrospect, 556
Sudden death from coronary occlusion, 908
Sulfamerazine, 998
Sulfonamide sensitivity, 813
Twenty-five years have passed, 117
U. S. cadet nurses corps, 812
Wagner-Murray bill, The, 725
War and disease, 197
Will Congress swell the ranks of bureaucracy? 998

F

Face and neck, The early treatment of injuries to the, 619
Facial injury, Unusually severe, 737
Fahr, George: The hypertension heart, 867
Feeding the child, 1039
Feldman, William H.: Naturally acquired tuberculosis in heterologic hosts, 437
Fever, Rocky Mountain spotted (case report), 715
Flink, Edmund B., and Bratrud, Theodor E.: Agranulocytosis associated with sulfadiazine therapy (case report), 898
Food preparation and preservation, 616
Foot functions following the loss of the tarsal navicular (case report), 545
Fractures, Intertrochanteric, 690
Fractures, Management of, under war conditions, 537
Fractures of lower end of radius and ulna, 697
Fractures, Ununited, 692
Fritsche, T. R.: Staphylococcic conjunctivitis, 263
Fundamental aspects of virus diseases, 606

G

Ganglia of the joint capsules and tendon sheaths, 734
Gastric mucosa, Changes in the, related to disease, 656
Gastric resection, Aseptic, for ulcer and carcinoma, 833
Geer, Everett K.: Transient infiltration of the lung parenchyma associated with eosinophilia (discussion only), 491
General care of the aged, 876
Genetics, Embryology and, in ectopia cordis abdominalis, 184
Gibson-Mickulicz tampon, Nonclosure of wounds in acute appendicitis and the use of the, 651
Gillespie, M. G.: Abdominal injuries, 529
Glabe, R. A.: Pain as a symptom in appendicitis, 622
Gray, Royal C.: Minnesota soldiers discharged for mental disability, 791

Green, Robert G.: Fundamental aspects of virus diseases, 606
Group hospitalization, 104

H

Haessler, F. H.: The diagnosis of corneal lesions, 243
Haessler, F. H.: Tuberculosis of the eye, 161
Hall, Harry B.: Management of fractures under war conditions, 537
Hammes, E. M.: Neurological complications associated with spinal anesthesia, 339
Hammes, E. M.: Neuropsychiatry then and now, 40
Haugen, John A.: The toxemias of pregnancy, 171
Hayes, James M.: Common duct repair by means of a vitallium tube (case report), 1064
Heart, The hypertension, 867
Hedberg, G. A.: Collapse therapy in treatment of pulmonary tuberculosis, 428
Helmholz, Henry F.: Emotional disturbances of children in wartime, 1044
Hemorrhage in pregnancy, 968
Hemorrhage in the menopause, 976
Hemorrhage, Obstetric, 355
Hemorrhages, Postpartum, and associated problems, 363
Henderson, Melvin S.: Progress in orthopedic surgery, 79
Henderson, Melvin S.: Ununited fractures, 692
Hengstler, William H.: Psychosomatic aspects of hypertension, 870
Henry, Myron O.: Intertrochanteric fractures, 690
Hertzog, Ambrose J.: Problems encountered in explaining certain cases of erythroblastosis fetalis on the Rh theory, 1057
Hilding, A. C.: Loss of cilia in the respiratory tract and its relation to death from respiratory disease, 272
History of Medicine in Minnesota, 108, 192, 290, 373, 447, 548, 629, 718, 805, 900, 992, 1067
Hoffman, Max H.: Endocrinology in the last quarter of a century, 43
Hospitalization, Group, 104
How a county can be accredited for tuberculosis control, 443
Hoyme, G.: Aerophagia, 350
Hoyne, Archibald L.: Modern methods of control for measles, scarlet fever and diphtheria, 167
Huenekens, E. J.: Preventive pediatrics in private practice, 48
Hullsiek, Harold E.: Enterogenous cysts of the rectum, 1008
Hunt, Arthur B.: Obstetric hemorrhage, 355
Hyperparathyroid disease due to tumor of the parathyroid, 1092
Hypertension heart, The, 867
Hypertension, Medical management of early cases of, 874
Hypertension, Pathologic changes in the auricles in auricular fibrillation associated with, 699
Hypertension, Psychosomatic aspects of, 870
Hypertension, Vitamin A in the treatment of, 369
Hyperthyroidism, Some problems in the pre-operative and postoperative care of patients with, 570

I

Industrial injuries, Management of, 705
Influence of war on medicine, The, 795
Injuries of the urinary tract, 1091
Injuries to the face and neck, The early treatment of, 619
Injury to spinal cord and meninges from spinal anesthetic (abstract only), 491
Intensive chemotherapy in early syphilis, 305
Internal medicine, Progress in, in Minnesota, 23
Intertrochanteric fractures, 690
Intervertebral disc, Protruded (case report), 547

Industrial Health

Fitting workers to their jobs, 204
For worker health and morale, 124
Industrial absenteeism, 303
Industrial physicians are needed, 732
Standing orders for nurses in industry, 1004

In Memoriam

Baird, Captain Lester W., 1014
Black, William, 390
Boquist, E. T. W., 642
Butler, John, 1013
Cooke, Louis J., 1011
Delavan, Philip A., 931
Dugan, Lawrence F., 838
Flores, Otonil, 390
Gordon, George J., 838
Johnson, Andrew Richard, 839
Johnson, Henry Porter, 459
King, Surgeon Lieutenant William Lyon Mackenzie, 1013
Lagerstrom, Francis Gustave, 390
Larsen, Oscar O., 1089
Lee, William Andrew, 123
Lindsay, William Vardeman, 642
Lloyd, Hiram J., 213
Luedtke, Gustav H., 390
McComb, Charles F., 459
Morrissey, Frank B., 739
Ohnstad, Jens L., 460
Paradis, William G., 740
Ritchie, Harry Parks, 208
Rothrock, John L., 739
Simison, Charles W., 390
Stewart, Allan Blanchard, 1089
Sullivan, Michael, 460
Swanson, Cephas, 839
Sweet, Albert B., 740
Swennes, Ole Samuel, 113
Thoreson, Merle O., 839
Towers, Frank Eugene, 840
Walker, George H., 740
Welch, Michael C., 460
Wilson, Louis Blanchard, 1090

J

Jenkinson, E. L., and Brown, W. H.: The differentiation of endometriosis and carcinoma of the sigmoid colon, 773
Johnson, James A.: Meckel's diverticulum, 655
Joint capsules and tendon sheaths, Ganglia of the, 734

K

Kamman, Gordon R., and Baker, A. B.: Damage to the spinal cord and meninges following spinal anesthesia—a clinico-pathological study, 786

Keettel, William C.: The management of occipito-posterior positions, 179
Kinsella, Thomas J.: Primary bronchiogenic carcinoma, 90
Kinsella, Thomas J.: Thoracic injuries, 524
Knight, Ralph T.: Spinal anesthesia—important principles, 346
Koenigsberger, Charles: Protruded intervertebral disc (case report), 547
Koucky, R. W.: Experiences with the Rh substance in transfusion reactions, 980

L

Lacerated wounds, Soap and water preparation of, 1093
Laryngeal palsy, 566
Leven, N. Logan: Treatment of burns, 534
Levine, Milton Gjelhaug, and Arbeiter, Herbert I.: Reinfection with pneumococcus meningitis (case report), 1065
Levine, Milton Gjelhaug, and State, David: Plasma and serum toxicity due to A and B substances, 1056
Lindsay, J. R.: Eustachian tube function and deafness, 250
Loss of cilia in the respiratory tract and its relation to death from respiratory disease, 272
Lundy, John S.: Twenty-five years of "Minnesota Medicine" and of anesthesiology, 57
Lundy, John S., and Tuohy, Edward B.: Newer trends in intravenous anesthesia, 349
Lung, Carcinoma of the, 1046
Lung parenchyma, Transient infiltration of the, associated with eosinophilia (discussion only), 491
Lynch, Francis W.: Intensive chemotherapy in early syphilis, 305

Mc

McGee, Horace D.: Postpartum hemorrhages and associated problems, 363
McLane, Evelyn G.: Successful treatment of extreme allergy to bee body and bee venom (case report), 1061
McPheeters, H. O.: Seed implantation skin grafts, 733.

M

Malignant melanomas of the uvea and their prognosis, 208
Malignant melanomata of the uvea, Prognosis of, from the standpoint of pathogenesis, cytology and fiber content, 210
Management of fractures under war conditions, 537
Management of industrial injuries, 705
Management of occipitoposterior positions, The, 179
Measles, scarlet fever and diphtheria, Modern methods of control for, 167
Meckel's diverticulum, 655
Medical management of early cases of hypertension, 874
Medical management of peptic ulcer, The (abstract), 205
Medicine in Minnesota sixty years ago, 97
Medicine, Postwar, 601
Medicine, The doctor of, and his responsibility, 352
Medicine, The influence of war on, 795
Melanomas, Malignant, of the uvea, and their prognosis, 208
Melanomata, malignant, of the uvea, Prognosis of, from the standpoint of pathogenesis, cytology and fiber content, 210
Meningitis, pneumococcus, Reinfection with (case report), 1065
Menopause, Hemorrhage in the, 976
Mental disability, Minnesota soldiers discharged for, 791
Metrazol treatment of psychoses, Use of curare in, 1052
Meyerding, Henry W.: Management of industrial injuries, 705
Miller, E. W.: Use of curare in metrazol treatment of psychoses, 1052
Minnesota soldiers discharged for mental disability, 791
Modern methods of control for measles, scarlet fever, and diphtheria, 167
Moersch, Herman J., and Tinney, William S.: Carcinoma of the lung, 1046
Mosquito problem, Thiamin chloride—an aid in the solution of the, 799

Medical Economics

Action in Chicago, 299
Big business points the way, 1000
Challenge to medicine, 1083
Congressional conference, 731
Congressmen listen to professions back home, 816
Corporation practice illegal in Minnesota, 912
Council meets, The, 386
"Doctor-shortage," 119
Health insurance in Canada, 641
How to secure payment of relief bills, 640
Industrial survey, 817
In the hopper, 300
Insuring against the "Third Hazard," 121
Medical and hospital obstetric and pediatric care for wives and infants of men in military service, 201
Medical congressman reports to his colleagues, A, 560
Minnesota State Board of Medical Examiners, 122, 202, 301, 387, 458, 562, 641, 913, 1002, 1085
Licentiates:
February 13, 1943, 388
April 10, 1943, 913
May 7E, 1943, 914
July 17, 1943, 915
November 5, 1943, 1086
New Council on Medical Services: its duties and powers, 728
New Jersey plan, 300
New pattern in medical service, 457
Planning Board report, 385
Planning for the future of medicine, 200
Railroad Brotherhood endorses Association policy, 639
Responsibility in terminal illness of recipients of OAA, 911
Rhode Island's sick benefit plan—first in U. S., 120
Stumbling block, 458
Threat to freedom, 1001

Miscellaneous

Unwarranted attack, An, 731
Minnesota Public Health Association, The, 818
Twenty-five years ago, 125

N

Naturally acquired tuberculosis in heterologic hosts, 437
Neck and face, The early treatment of injuries to the, 619
Neff, Frank C.: Practical applications of a routine blood count in the newborn, 779
Nelson, Harvey: Ganglia of the joint capsules and tendon sheaths, 734

Nerves, Spontaneous paralysis of the seventh and eighth, with recovery, 270
Neuburger, Max: The discovery of the pulmonary circulation of the blood, 1054
Neurological complications associated with spinal anesthesia, 339
Neuropsychiatry then and now, 40
Neurosurgery, Evolution of, 66
New, Gordon B.: The early treatment of injuries to the face and neck, 619
Newer trends in intravenous anesthesia, 349
Nonclosure of wounds in acute appendicitis and the use of the Gibson-Mickulicz tampon, 651
Norman, J. F.: General care of the aged, 876
Nutritional management of the aged, 881
Nutrition in normal adults, 610
Nutting, R. E.: Feeding the child, 1039

New Policies and Procedures

Guide for setting up policies and physicians' recommendations for local public health nursing services, A, 647
New policies of State Department of Health regarding biologics, 643
Procedure for collecting medical bills for services to the indigent, 650

O

Obstetric hemorrhage, 355
Obstetrics in the home, 176
Obstetrics, The progress of, during the past twenty-five years, 84
Obstruction, Acute, of the bowel, 1009
Occipitoposterior positions, The management of, 179
Orthopedic surgery, Progress in, 79
Otitis media, Acute suppurative—a reconsideration, 257

P

Pain as a symptom in appendicitis, 622
Palmerton, E. S.: Obstetrics in the home, 176
Palsy, Laryngeal, 566
Paralysis, Spontaneous, of the seventh and eighth nerves, with recovery, 270
Parathyroid, Hyperparathyroid disease due to tumor of the, 1092
Patch, Orien B.: Spontaneous paralysis of the seventh and eighth nerves, with recovery, 270
Pathologic changes in the auricles in auricular fibrillation associated with hypertension, 699
Pathology, clinical, The development of, as a specialty, 52
Paulson, Elmer C.: Foot functions following the loss of the tarsal navicular (case report), 545
Pediatrics, Preventive, in private practice, 48
Peptic, ulcer, The medical management of (abstract), 205
Peptic ulcer, The surgical management of—a chemical problem (abstract), 206
Phelps, Kenneth: Laryngeal palsy, 566
Physician in civic life, The, 521
Plasma and serum toxicity due to A and B substances, 1056
Pneumococcus meningitis, Reinfection with (case report), 1065
Pneumonia, Atypical, 337
Poliomyelitis, epidemic and experimental, Studies on the diagnosis and treatment of, with poliomyelitis antistreptococcic serum; summary of results, 890
Postpartum hemorrhages and associated problems, 363
Postwar medicine, 601
Practical applications of a routine blood count in the newborn, 779
Pregnancy, Hemorrhage in, 968
Pregnancy, The toxemias of, 171
Pregnancy, Use of the sulfonamides in, 173
Prendergast, H. J.: Ectopia cordis, 182
Preparing the child for school, 1041
President's Letter, 115, 196, 295, 380, 453, 634, 724, 811, 906, 997, 1076
Preventive pediatrics in private practice, 48
Primary bronchiogenic carcinoma, 90
Problems encountered in explaining certain cases of erythroblastosis fetalis on the Rh theory, 1057
Procurement and assignment service for physicians, dentists and veterinarians, The, 419
Prognosis of malignant melanomata of the uvea from the standpoint of pathogenesis, cytology and fiber content, 210
Progress in internal medicine in Minnesota, 23
Progress in orthopedic surgery, 79
Progress in the diagnosis and treatment of diseases of the urogenital tract, 74
Progress of obstetrics during the past twenty-five years, The, 84
Protruded intervertebral disc (case report), 547
Psychoses, Use of curare in metrazol treatment of, 1052
Psychosomatic aspects of hypertension, 870
Pulmonary circulation of the blood, The discovery of the, 1054

R

Radiology, Advances in, in the past quarter-century, 87
Radius and ulna, Fractures of lower end of, 697
Randall, Lawrence M.: Hemorrhage in the menopause, 976
Rankin, Fred W.: Postwar medicine, 601
Rea, Charles E.: Shock, its cause and treatment, 531
Rea, Charles E.: Some problems in the pre-operative and postoperative care of patients with hyperthyroidism, 570
Recent advances in our knowledge of coronary sclerosis and its bearing on the clinical management of patients, 863
Rectum, Enterogenous cysts of the, 1008
Reinfection with pneumococcus meningitis (case report), 1065
Reminiscences, 99
Resection, Transurethral, 782
Respiratory tract, Loss of cilia in the, and its relation to death from respiratory disease, 272
Rh substance, Experiences with the, in transfusion reactions, 980
Rice, Carl O.: Hyperparathyroid disease due to tumor of the parathyroid, 1092
Rigler, Leo: Roentgenologic observation on bronchial occlusion (abstract), 1097
Rocky Mountain spotted fever (case report), 715
Roentgenologic observation on bronchial occlusion (abstract), 1097
Rosenow, Edward C.: Studies on the diagnosis and treatment of epidemic and experimental poliomyelitis with poliomyelitis antistreptococcic serum, summary of results, 890
Rupture of the long head of the biceps brachii, 834
Rupture of the long head of the biceps muscle of the arm, 836

Reports and Announcements

AMA scientific exhibit, 1098
American Board of Obstetrics and Gynecology, 929
American Board of Ophthalmology, 1098
American College of Surgeons, 310
American Congress of Physical Therapy, 662, 742
American Urological Association, 310
Association of Military Surgeons, 844, 929
Bureau for Crippled Children, Division of Social Welfare Medical Unit, fall clinic schedule, 742
Civil Service examinations for medical guard-attendants and medical technical assistants, 742
Clay-Becker Medical Society, 312
Congress on Industrial Health, 128
Continuation course in otolaryngology, 1098
Continuation study courses, 494
Course in electrocardiography, 494
Hennepin County Medical Society, 569
Important announcement (Castoria), 569
Invalid diets and food rationing, 392
Journal-Lancet lecture, 494
Judd, E. Starr, lecture, 214, 311, 930
Legal Medicine Conference and Seminar, 744
Medical broadcast, 128, 214, 310
Minneapolis Surgical Society:
Meeting of October 1, 1942, 570
Meeting of November 5, 1942, 651
Meeting of March 4, 1943, 733
Meeting of April 1, 1943, 833
Meeting of October 7, 1943, 1091
Minnesota Academy of Medicine:
Meeting of October 14, 1942, 205
Meeting of November 11, 1942, 208
Meeting of December 9, 1942, 305
Meeting of January 13, 1943, 392
Meeting of February 10, 1943, 491
Meeting of March 10, 1943, 566
Meeting of April 14, 1943, 656
Meeting of May 12, 1943, 1008
Meeting of October 13, 1943, 1097
Minnesota Hospital Association, 742
Minnesota Society of Neurology and Psychiatry, 214, 391, 569, 1098
Minnesota State Medical Association:
Annual meeting plans (1944), 929
Proceedings, 819, 916
Program, Annual meeting, 488
Roster, 461
Mississippi Valley Medical Society, 742
Northern Minnesota Medical Association, 743
Ramsey County Medical Society, 131
Refresher course, 312
Renville County Medical Society, 131
Report of state delegates to House of Delegates of the American Medical Association, 660
St. Louis County Medical Society, 131
Sigma Xi lectures, 311
Southern Minnesota Medical Association, 743
Steele County Medical Society, 312
Upper Mississippi Medical Association, 312
Urology award, 128
Wabasha County Medical Society, 1015
War Conference, 391
War Surgery meeting, 130
Washington County Medical Society, 132, 312, 569, 930, 1098
West Central Medical Society, 1015
Winona County Medical Society, 214
Woman's Auxiliary, 132, 393, 490, 576, 663, 1100

S

Sanford, Arthur H.: The development of clinical pathology as a specialty, 52
Sax, Simon G.: Medical management of early cases of hypertension, 874
Scarlet fever, measles and diphtheria, Modern methods of control for, 167
Schaaf, F. H. K.: Chronic or recurrent brucellosis, 568
Schatz, F. J.: Hemorrhage in pregnancy, 968
Schuldt, F. C.: Embryology and genetics in ectopia cordis abdominalis, 183
Schwyzer, Arnold: Abdominal pain, 61
Schwyzer, Arnold: White bile, 955
Sclerosis, coronary, Recent advances in our knowledge, of, and its bearing on the clinical management of patients, 863
Seed implantation skin grafts, 733
Serum, Plasma and, toxicity due to A and B substances, 1056
Shannon, W. Ray: Thiamin chloride—an aid in the solution of the mosquito problem, 799
Shock, its cause and treatment, 531
Sigmoid colon, endometriosis and carcinoma of the, The differentiation of, 773
Sinykin, Melvin B.: Use of the sulfonamides in pregnancy, 173
Skin grafts, Seed implantation, 733
Slater, S. A.: How a county can be accredited for tuberculosis control, 443
Soap and water preparation of lacerated wounds, 1093
Soltman, D. Jack, and Culligan, John M.: Trauma of the spleen, 710
Some problems in the pre-operative and postoperative care of patients with hyperthyroidism, 570
Speech, Delayed, from the standpoint of a psychologist, 369
Spinal anesthesia, Damage to the spinal cord and meninges following—a clinico-pathological study, 786
Spinal anesthesia—important principles, 346
Spinal cord and meninges, Damage to the, following spinal anesthesia—a clinico-pathological study, 786
Spine, Compression fractures of the, 687
Spink, Wesley W.: Atypical pneumonia, 337
Spleen, Trauma of the, 710
Spontaneous paralysis of the seventh and eighth nerves, with recovery, 270
Staphylococcic conjunctivitis, 263
State, David, and Levine, Milton Gjelhaug: Plasma and serum toxicity due to A and B substances, 1056
Stover, Lee, and Dry, Thomas J.: Pathologic changes in the auricles in auricular fibrillation associated with hypertension, 699
Strakosch, Ernest A., and Clark, William G.: The beneficial effect of urea in topical sulfonamide therapy, 276
Studies on the diagnosis and treatment of epidemic and experimental poliomyelitis with poliomyelitis antistreptococcic serum; summary of results, 890
Successful treatment of extreme allergy to bee body and bee venom (case report), 1061

Sulfadiazine therapy, Agranulocytosis associated with (case report), 898
Sulfonamide therapy, topical, The beneficial effect of urea in, 276
Sulfonamides, Use of the, in pregnancy, 173
Surgical management of peptic ulcer—a chemical problem (abstract), 206
Surgical treatment of the aged, 884
Sweetser, Theodore H.: Injuries of the urinary tract, 1091
Swendson, James J.: Episiotomy, 539
Syphilis, early, Intensive chemotherapy in, 305

T

Tarsal navicular, Foot functions following the loss of the (case report), 545
Tendon sheaths, joint capsules and, Ganglia of the, 734
Thiamin chloride—an aid in the solution of the mosquito problem, 799
Thomas, Gilbert J.: Progress in the diagnosis and treatment of diseases of the urogenital tract, 74
Thoracic injuries, 524
Tinney, William S., and Moersch, Herman J.: Carcinoma of the lung, 1046
Todd, Ramona L.: Congenital arteriovenous aneurysm (case report), 627
Toxemias of pregnancy, The, 171
Toxicity, Plasma and serum, due to A and B substances, 1056
Transfusion reactions, Experiences with the Rh substance in, 980
Transient infiltration of the lung parenchyma associated with eosinophilia (discussion only), 491
Transurethral resection, 782
Trauma of the spleen, 710
Treatment of burns, 534
Treatment of craniocerebral injuries in modern warfare, 282
Tregilgas, H. R.: Rocky Mountain spotted fever (case report), 715
Tuberculosis, Chest conditions simulating, 430
Tuberculosis control, How a county can be accredited for, 443
Tuberculosis, early, Diagnosis of, among University students, 439
Tuberculosis in heterologic hosts, Naturally acquired, 437
Tuberculosis of the eye, 161
Tuberculosis, pulmonary, Collapse therapy in treatment of, 428
Tuohy, Edward B., and Lundy, John S.: Newer trends in intravenous anesthesia, 349
Tuohy, Edward L.: Nutritional management of the aged, 881
Tuohy, E. L.: Progress in internal medicine in Minnesota, 23
Twenty-five years of "Minnesota Medicine" and of anesthesiology, 57

U

Ulcer and carcinoma, Aseptic gastric resection for, 833
Ulcer, peptic, The medical management of (abstract), 205
Ulcer, peptic, The surgical management of—a chemical problem (abstract), 206
Ulna, radius and, Fractures of lower end of, 697
Ununited fractures, 692
Unusually severe facial injury, 737
Urea, The beneficial effect of, in topical sulfonamide therapy, 276
Urinary tract, Injuries of the, 1091
Urogenital tract, Progress in the diagnosis and treatment of diseases of the, 74
Use of curare in metrazol treatment of psychoses, 1052
Use of the sulfonamides in pregnancy, 173
Uterine bleeding, Abnormal, in adolescence, 961
Uvea, Malignant melanomas of the, and their prognosis, 208
Uvea, Prognosis of malignant melanomata of the, from the standpoint of pathogenesis, cytology and fiber content, 210

V

Virus diseases, Fundamental aspects of, 606
Virus diseases of animals, 604
Visual malingering, 266
Vitallium tube, Common duct repair by means of a (case report), 1064
Vitamin A in the treatment of hypertension, 370

W

Wangensteen, O. H.: The surgical management of peptic ulcer—a chemical problem (abstract), 206
War, The influence of, on medicine, 795
Webb, R. C.: Rupture of the long head of the biceps brachii, 834
Webb, R. C.: Soap and water preparation of lacerated wounds, 1093
Wetherby, Macnider, and Blumenthal, Jacob S.: Vitamin A in the treatment of hypertension, 370
White bile, 955
Willius, Frederick A.: Coronary disease, 33
Winther, Nora: Abnormal uterine bleeding in adolescence, 961
Wounds, lacerated, Soap and water preparation of, 1093

War Bulletins

Statement of chairman, directing board Procurement and Assignment Service for physicians, dentists and veterinarians, 564
Statement of the Surgeon General of the United States Army, 564
Statement of the Surgeon General of the United States Navy, 564
Statement of the Surgeon General of the United States Public Health Service, 564

Y

Yoerg, O. W.: Rupture of the long head of the biceps muscle of the arm, 836

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 **January, 1943** **No. 1**

Contents

PROGRESS IN INTERNAL MEDICINE IN MINNESOTA.
E. L. Tuohy, B.A., M.D., F.A.C.P., Duluth, Minnesota 23

CORONARY DISEASE.
Fredrick A. Willius, M.D., Rochester, Minnesota 33

NEUROPSYCHIATRY THEN AND NOW.
E. M. Hammes, M.D., Saint Paul, Minnesota... 40

ENDOCRINOLOGY IN THE LAST QUARTER OF A CENTURY.
Max H. Hoffman, M.D., Saint Paul, Minnesota.. 43

PREVENTIVE PEDIATRICS IN PRIVATE PRACTICE.
E. J. Huenekens, M.D., Minneapolis, Minnesota.. 48

THE DEVELOPMENT OF CLINICAL PATHOLOGY AS A SPECIALTY.
Arthur H. Sanford, M.D., Rochester, Minnesota 52

TWENTY-FIVE YEARS OF "MINNESOTA MEDICINE" AND OF ANESTHESIOLOGY.
John S. Lundy, M.D., Rochester, Minnesota..... 57

ABDOMINAL PAIN.
Arnold Schwyzer, M.D., Saint Paul, Minnesota.. 61

EVOLUTION OF NEUROSURGERY.
Alfred W. Adson, M.D., Rochester, Minnesota.. 66

PROGRESS IN THE DIAGNOSIS AND TREATMENT OF DISEASES OF THE UROGENITAL TRACT.
Gilbert J. Thomas, M.D., Minneapolis, Minnesota 74

PROGRESS IN ORTHOPEDIC SURGERY.
Melvin S. Henderson, M.D., Rochester, Minnesota 79

THE PROGRESS OF OBSTETRICS DURING THE PAST TWENTY-FIVE YEARS.
W. A. Coventry, M.D., Duluth, Minnesota..... 84

ADVANCES IN RADIOLOGY IN THE PAST QUARTER-CENTURY.
R. G. Allison, M.D., Minneapolis, Minnesota..... 87

PRIMARY BRONCHIOGENIC CARCINOMA.
Thos. J. Kinsella, M.D., Minneapolis, Minnesota.. 90

MEDICINE IN MINNESOTA SIXTY YEARS AGO.
William Davis, M.D., Saint Paul, Minnesota..... 97

REMINISCENCES.
E. Sydney Boleyn, M.D., Stillwater, Minnesota.. 99

GROUP HOSPITALIZATION.
Arthur M. Calvin, Saint Paul, Minnesota..... 104

CLINICAL PATHOLOGICAL CONFERENCE:
Presentation of a Case.
A. J. Hertzog, M.D., and *S. V. Lofsness, M.D.*... 106

HISTORY OF MEDICINE IN MINNESOTA:
The Asiatic Cholera in Saint Paul (continued)
John M. Armstrong, M.D., Saint Paul, Minnesota 108

PHOTOGRAPH, Stephen H. Baxter, M.D., President, Minnesota State Medical Association..... 114

PRESIDENT'S LETTER 115

EDITORIAL:
Early Days 116
Greetings from the Medical School 116
Twenty-Five Years Have Passed..... 117
Improvement in Mortality Statistics..... 118
The Incidence of Syphilis..... 118

MEDICAL ECONOMICS:
"Doctor-Shortage" 119
Rhode Island's Sick Benefit Plan—First in U. S. 120
Insuring Against the "Third Hazard"..... 121
Minnesota State Board of Medical Examiners, Physicians Licensed November 13, 1942..... 122

IN MEMORIAM 123

INDUSTRIAL HEALTH:
For Worker Health and Morale..... 124

TWENTY-FIVE YEARS AGO..... 125

REPORTS AND ANNOUNCEMENTS 128

WOMAN'S AUXILIARY 132

COMMUNICATION 134

OF GENERAL INTEREST 135

Contents of MINNESOTA MEDICINE copyrighted by Minnesota State Medical Association, 1943

Entered at the Post Office in Minneapolis as second class mail matter. Accepted for mailing at the special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 13, 1918.

MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL ASSOCIATION

Published by the Association under the direction of its Editing and Publishing Committee

EDITING AND PUBLISHING COMMITTEE

E. M. HAMMES, Saint Paul
PHILIP F. DONOHUE, Saint Paul
H. W. MEYERDING, Rochester
H. A. ROUST, Montevideo
B. O. MORK, JR., Worthington
A. H. WELLS, Duluth
O. W. ROWE, Duluth
T. A. PEPPARD, Minneapolis
HENRY L. ULRICH, Minneapolis
C. L. OPPEGAARD, Crookston

EDITORIAL STAFF

CARL B. DRAKE, Saint Paul, Editor
GEORGE EARL, Saint Paul, Associate Editor
HENRY L. ULRICH, Minneapolis, Associate Editor

BUSINESS MANAGER

J. R. BRUCE

Annual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian Subscriptions—$3.50.

The right is reserved to reject material submitted for editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

Classified advertising—five cents a word; minimum charge, $1.00. Remittance should accompany order.

Display advertising rates on request.

Address all communications to Minnesota Medicine, 2642 University Avenue, Saint Paul, or National Bldg., Minneapolis. Telephone Nestor 2641.

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN



MAIN BUILDING—ONE OF THE 5 UNITS IN "COTTAGE PLAN"

A Modern Private Sanitarium for the Diagnosis, Care and Treatment of Nervous, Mental and Medical Cases

Located on beautiful Lake St. Croix, eighteen miles from the Twin Cities, it has the advantages of botb City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Milk, cream and butter from our own herd of Tuberculin-tested Registered Guernsey Cows. Inspection and coöperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

CONSULTING NEURO-PSYCHIATRISTS

Hewitt B. Hannah, M.D.
Joel C. Hultkrans, M.D.
511 Medical Arts Building
Minneapolis, Minnesota
Tel. MAin 4672

RESIDENT PHYSICIAN
Howard J. Laney, M.D.
Prescott, Wisconsin
Tel. 39

SUPERINTENDENT
Ella M. Mackie
Prescott, Wisconsin
Tel. 69



To Facilitate Diagnosis

and instrumentation involving
engorged mucus membranes, utilize the fast, powerful,
sustained vasoconstriction of

Neo-Synephrine

Hydrochloride

(laevo—alpha—hydroxy—beta—methyl—amino—3 hydroxy ethylbenzene hydrochloride)



ACCEPTED
AMERICAN MEDICAL ASSN
Council on Pharmacy and Chemistry

Available in 1% solution in 1-oz. bottles for dropper, spray or instillation; and as a ½% jelly in collapsible tube with applicator.

Frederick Stearns & Company

Since 1855... ESSENTIALS OF THE PHYSICIAN'S ARMAMENTARIUM

NEW YORK KANSAS CITY **DETROIT, MICHIGAN** SAN FRANCISCO WINDSOR, ONTARIO
SYDNEY, AUSTRALIA AUCKLAND, NEW ZEALAND

Lowered resistance to tuberculosis... How to watch for it!



TUBERCULIN PATCH TEST (Vollmer)
Lederle

WAR ITSELF MAY BE VIEWED as a cyclic epidemic that brings in its train a whole series of infections to prey upon the exhaustion of its victims. *Malnutrition*, *overcrowding*, *overactivity* and *undue exposure to cold and wet* combine to harass civilians and combatants alike when war is fought as much upon the home front as in the combat zone.

When to these factors of lowered resistance is added contact with clinical tuberculosis, the stage is set for rapid spread of the disease among the susceptible elements of the population. Thus in war the secular downward trend of tuberculosis flattens out and may exhibit a war-time ascent.

The "TUBERCULIN PATCH TEST (Vollmer) *Lederle*" has facilitated large-scale case-finding surveys by school and public health authorities[1,2] throughout the United States. It has the advantages of *ease of application*, *reliability* and *painlessness*.

[1]NARODICK, P. H. (Supt. and Med. Director, King County Tuberculosis Hosp., Seattle, Wash.): Northwest Med. 41:193 (June) 1942.

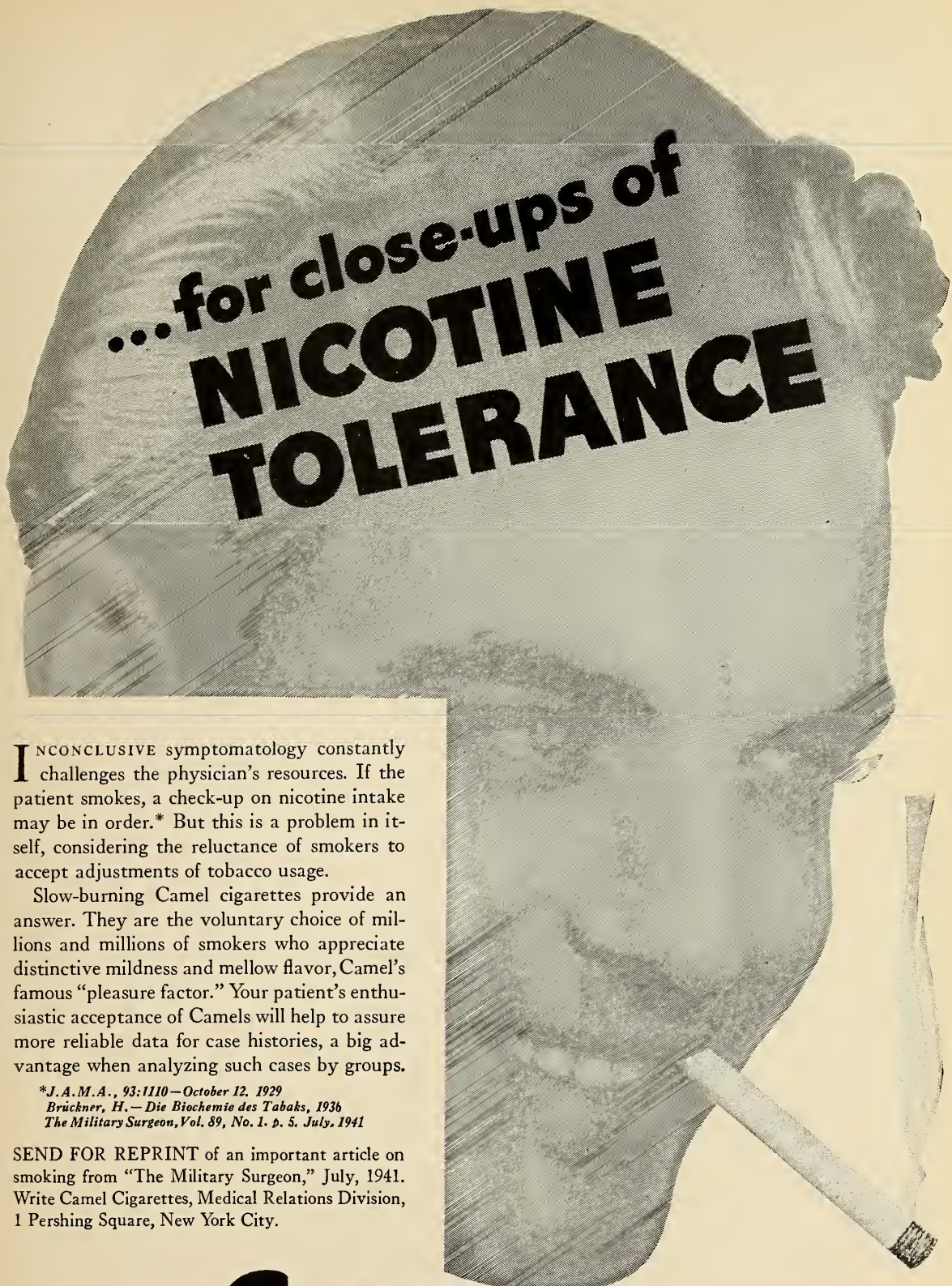
[2]COHEN, P. (Santa Barbara County Health Dept., Santa Barbara, California): California & West. Med. 56:70 (Feb.) 1942.

Supplied in packages of
1, 10 and 100 tests

NOW IS THE TIME FOR EVERY COMMUNITY TO START A CASE-FINDING CAMPAIGN TO HALT THE RAVAGES OF THIS COMMON FOE!

Specify **Lederle**

LEDERLE LABORATORIES, INC., 30 Rockefeller Plaza, New York, N. Y.



INCONCLUSIVE symptomatology constantly challenges the physician's resources. If the patient smokes, a check-up on nicotine intake may be in order.* But this is a problem in itself, considering the reluctance of smokers to accept adjustments of tobacco usage.

Slow-burning Camel cigarettes provide an answer. They are the voluntary choice of millions and millions of smokers who appreciate distinctive mildness and mellow flavor, Camel's famous "pleasure factor." Your patient's enthusiastic acceptance of Camels will help to assure more reliable data for case histories, a big advantage when analyzing such cases by groups.

*J.A.M.A., 93:1110—October 12. 1929
Brückner, H.—Die Biochemie des Tabaks, 1936
The Military Surgeon, Vol. 89, No. 1. p. 5. July. 1941

SEND FOR REPRINT of an important article on smoking from "The Military Surgeon," July, 1941. Write Camel Cigarettes, Medical Relations Division, 1 Pershing Square, New York City.

CAMEL

costlier tobaccos

The swaddled infant pictured at right is one of the famous works in terra cotta exquisitely modeled by the fifteenth century Italian sculptor, Andrea della Robbia. In that day infants were bandaged from birth to preserve the symmetry of their bodies, but still the gibbous spine and distorted limbs of severe rickets often made their appearance.



A bambino from the Foundling Hospital, Florence, Italy,—A. della Robbia

Glisson, writing in 1671, described an ingenious use of swaddling bands — "first crossing the Brest and coming under the Armpits, then about the Head and under the Chin and then receiving the hands by two handles, so that it is a pleasure to see the Child hanging pendulous in the Air . . . This kind of Excercise . . . helpeth to restore the crooked Bones. . . ."

STRAPPED FOR RICKETS

SWADDLING was practised down through the centuries, from Biblical times to Glisson's day, in the vain hope that it would prevent the deformities of rickets. Even in sunny Italy swaddling was a prevailing custom, recommended by that early pediatrician, Soranus of Ephesus, who discoursed on "Why the Majority of Roman Children are Distorted."

"This is observed to happen more in the neighborhood of Rome than in other places," he wrote. "If no one oversees the infant's movements, his limbs do in the generality of cases become twisted. . . . Hence, when he first begins to sit he must be propped by swathings of bandages. . . ." Hundreds of years later swaddling was still prevalent in Italy, as attested by the sculptures of the della Robbias and their contemporaries. For infants who were strong Glisson suggested placing "Leaden Shooes" on their feet and suspending them with swaddling bands in mid-air.

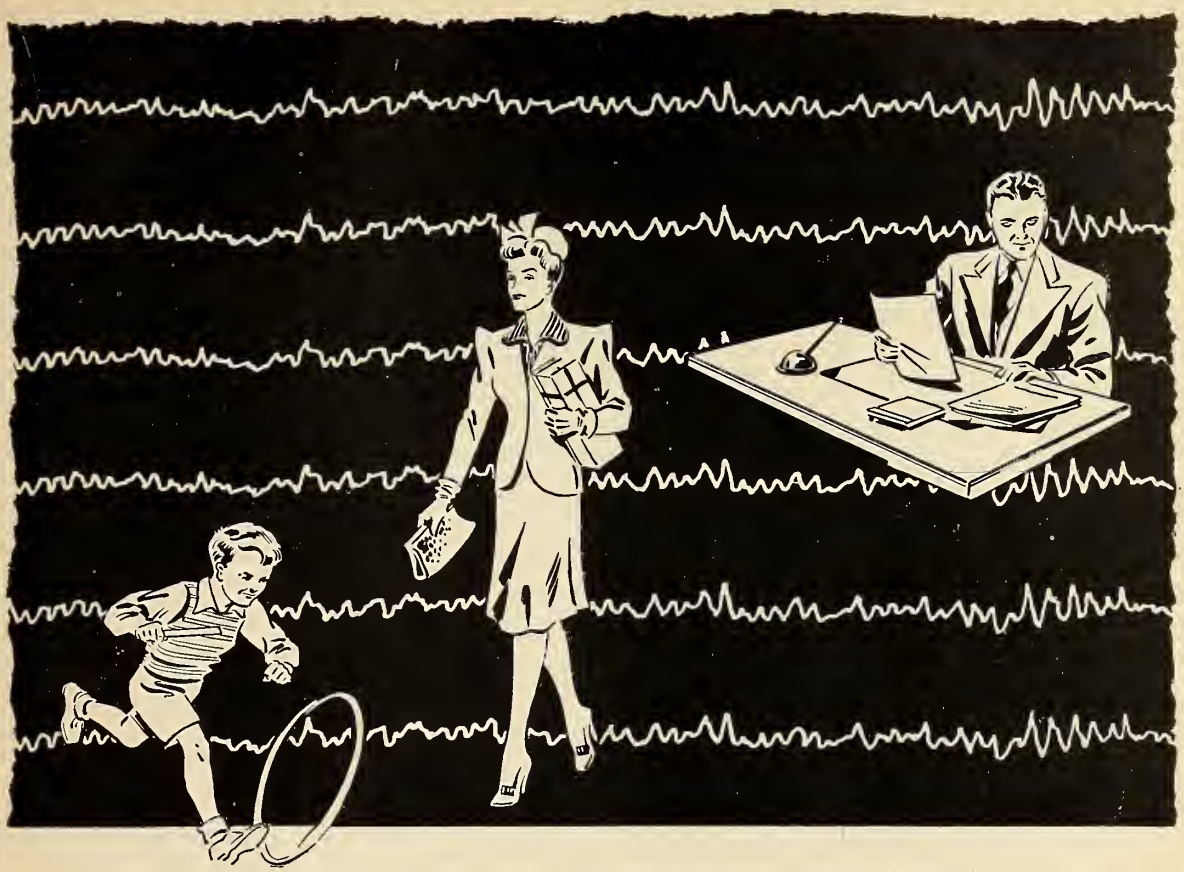
How amazed the ancients would have been to know that bones can be helped to grow straight simply by internal administration of a few drops of Oleum Percomorphum. What to them would have been a miracle has become a commonplace of science. Because it can be administered in drop dosage, Oleum Percomorphum is especially suitable for young and premature infants, who are most susceptible to rickets. Its vitamins derived from natural sources, this product is rich in vitamins A and D. Important also to your patients, Oleum Percomorphum is an economical antiricketic.

EXIGENCY OF WAR

Oleum Percomorphum 50% is now known as Oleum Percomorphum 50% With Viosterol. The potency remains the same; namely, 60,000 vitamin A units and 8,500 vitamin D units per gram. It consists of the liver oils of percomorph fishes, viosterol, and fish liver oils, a source of vitamins A and D in which not less than 50% of the vitamin content is derived from the liver oils of percomorph fishes (principally Xiphias gladius, Pneumatophorus diego, Thunnus thynnus, Stereolepis gigas, and closely allied species).

MEAD JOHNSON & COMPANY, Evansville, Indiana, U. S. A.

Please enclose professional card when requesting samples of Mead Johnson products to cooperate in preventing their reaching unauthorized persons



The Moving Finger Writes

OF MORE NORMAL, HAPPIER PEOPLE

THE oscillating "finger" of the electroencephalograph, recording abatement of abnormality of brain waves, tells but a part of the story of epilepsy treatment with Dilantin+ Sodium. Fewer and less severe seizures, more normal social and economic life have been observed in many thousands of epileptic patients receiving this modern anticonvulsant.

Dilantin Sodium possesses "many advantages" in the control of epileptic convulsions.[1] For one thing it is, in many cases, superior in anticonvulsant effectiveness to phenobarbital or bromides, and—highly important—it is practically non-hypnotic. The inclusion of Dilantin Sodium (diphenylhydantoin sodium) in the new U.S.P. XII speaks volumes for its therapeutic importance.

+TRADE-MARK REG. U.S. PAT. OFF.

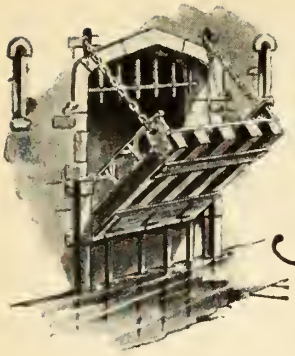
PARKE, DAVIS & COMPANY
DETROIT, MICHIGAN

KAPSEALS

DILANTIN SODIUM

A product of modern research offered to the medical profession

1. Palmer, H. D. & Hughes, J.: *The Penn. Med. J.*, Aug. 1942



Safeguarding

YOUR USE OF

BENZEDRINE SULFATE TABLETS

Any potent drug should be administered under medical supervision, and Benzedrine Sulfate* is no exception.

In medical literature, the majority of the reports of undesirable reactions attributed to Benzedrine Sulfate have been traceable to cases of indiscriminate or unsupervised use. This is equally true of the often magnified and sensational reports in the lay press.

Obviously, these unfavorable reports greatly retarded the wider clinical use of this valuable therapeutic agent. From the very beginning, Smith, Kline & French Laboratories—as a matter of business judgment, to say nothing of ethical considerations—did what it could to keep Benzedrine Sulfate solely in the hands of the medical profession.

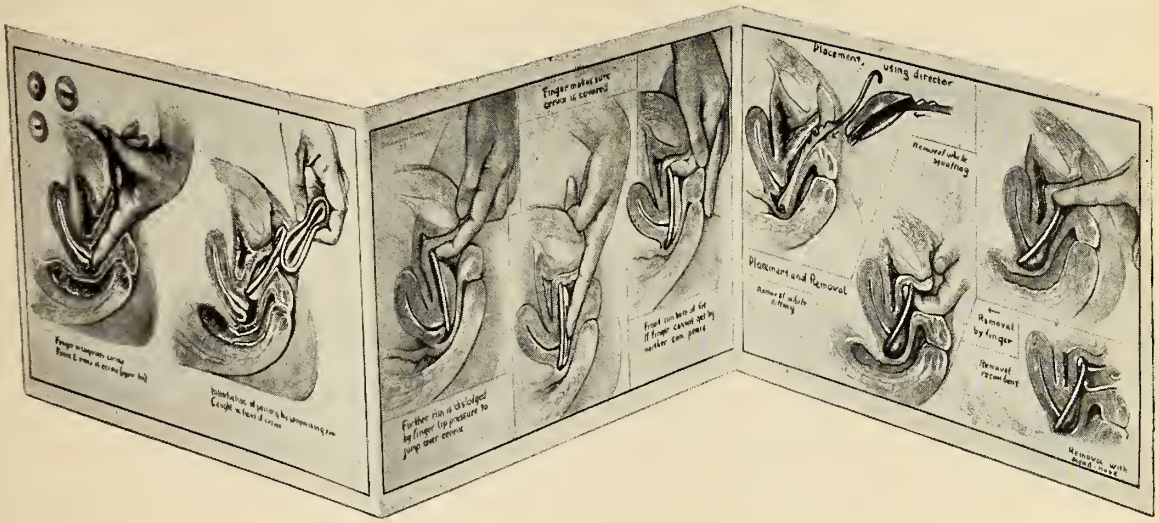
But our own unaided efforts never met with complete success. And, understandably concerned over the possibility of self-medication, certain physicians hesitated to employ Benzedrine Sulfate therapy.

However, when the Federal Food, Drug & Cosmetic Act of June, 1938, became effective, we immediately put Benzedrine Sulfate in the category of drugs to be sold on prescription only. The Act is strictly enforced and is supplemented by similar legislation in many states. Today, as a result, the physician can prescribe Benzedrine Sulfate, secure in the knowledge that there is little likelihood of its abuse.

**Brand of amphetamine sulfate*

SMITH, KLINE & FRENCH LABORATORIES, PHILADELPHIA, PA.

11th Edition Now Out *Send for Copy*



The Technique *of* Fitting Diaphragms

A series of charts in booklet form (6 x 9) clearly illustrating the technique of fitting diaphragms by the physician, now accompanied by the Dickinson-Freret Charts in two colors. For use by the physician in explaining the technique to his patient. These charts are regarded as the most helpful explanatory aid on the subject ever published. Eleventh edition now out. Write, or use coupon, for a copy.

Holland-Rantos
Company, Inc.
551 FIFTH AVENUE, NEW YORK, N. Y.

Holland-Rantos Co., Inc.
551 Fifth Avenue
New York, N. Y.

Without cost, please send your booklet on Fitting Technique to:

Dr.....

Street.....

City.....State.....

HERE ARE THE FACTS, TO DATE, ON SMOKING:

IN 1933: Because of a new method of manufacture, PHILIP MORRIS introduced the first drastic improvement in cigarette manufacture, accompanied by *a definite improvement in effect on smokers.*

UP TO 1943: PHILIP MORRIS have shown the greatest percentage of increase in sales of *any cigarette.*

THE REASON: PHILIP MORRIS are *different* from other cigarettes. Repeated tests* have proved their individual method of manufacture makes them *definitely and measurably less irritating to the smoker's nose and throat.*

YOUR OWN CHECK-UP will quickly *confirm* that statement. Why not try PHILIP MORRIS on your patients who smoke . . . and see the results for yourself?

PHILIP MORRIS

PHILIP MORRIS & CO., LTD., INC.
119 FIFTH AVENUE, N. Y.

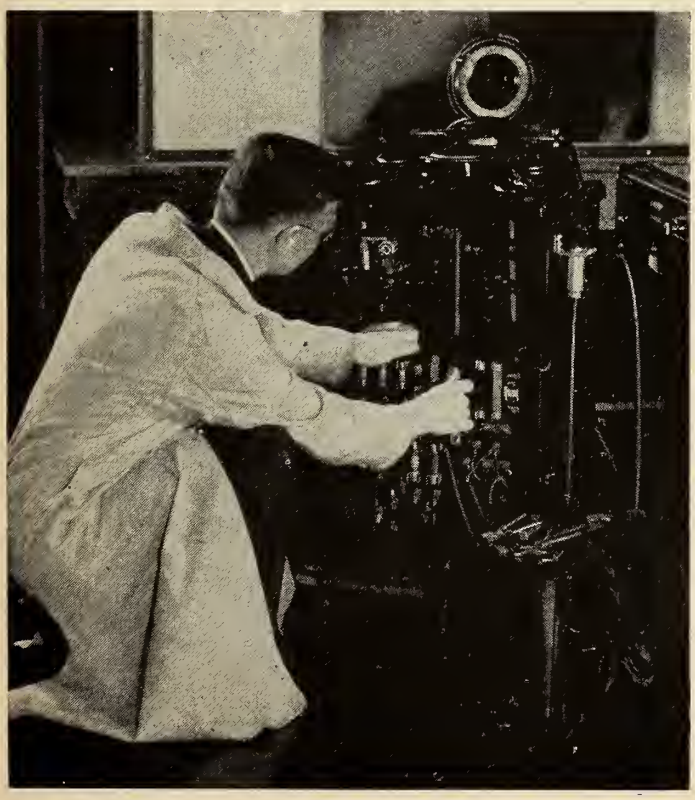
* *Laryngoscope, Feb. 1935, Vol. XLV, No. 2, 149-154; Laryngoscope, Jan. 1937, Vol. XLVII, No. 1, 58-60*

TO PHYSICIANS WHO SMOKE A PIPE: We suggest an unusually fine new blend—COUNTRY DOCTOR PIPE MIXTURE. Made by the same process as used in the manufacture of Philip Morris Cigarettes.

That was not an idle promise—

when, during the halcyon pre-war days, buyers of G-E x-ray and physical therapy apparatus were assured of maintenance and technical service throughout the life of the apparatus. ¶ To make good that promise—despite trying difficulties which the war now imposes—G.E.'s branch offices and service depots continue to function throughout the United States and Canada. ¶ Of course, it isn't possible for the local G-E service man to call as often as heretofore, what with rationed tires and gas and other transportation problems. But he is always available when there is need for service on equipment. In fact, he feels that the most important part of his job these days is to help keep G-E equipment in the best possible operating condition, for the busier-than-ever physicians' offices, clinics, and hospitals in his territory. *He will not let you down!*

Today's Best Buy – U.S. War Bonds



In your particular area this maintenance and technical service is extended through the following G-E offices and service depots:

MINNEAPOLIS
321 Medical Arts Bldg.
Nicollet Ave. & Ninth St.

DULUTH
526½ East First Street

GREEN ISLE
Mr. N. E. McMahon

ST. PAUL
174 E. Sixth Street

SIOUX FALLS, S. DAK.
2028 S. Covel Ave.

FARGO, N. DAK.
712 Fourth St., S.

GENERAL ELECTRIC X-RAY CORPORATION

HAMM BUILDING

ST. PETER BETWEEN 6TH & 7TH ST. PAUL, MINN.

We have space in the HAMM BUILDING that will lend itself very well to doctors' offices.

May we show you what we can do?

UNITED PROPERTIES INCORPORATED

GARFIELD 4303

POKEGAMA SANATORIUM

operated by

H. LONGSTREET TAYLOR FOUNDATION



Reception Hospital

Thoroughly Equipped for the

Medical and Surgical Treatment of

TUBERCULOSIS

Artificial pneumothorax, oleothorax, phrenicectomy, thoracoplasty, pneumolysis, bronchoscopy, alpine lamp and heliotherapy. Operating, throat, dental and lamp rooms. Complete clinical and X-ray Laboratories.

Electric Blankets in All Beds

A reduction has been made in rates.

Railroad, Bus, Telegraph and Telephone Stations: Pine City, Minn. Descriptive circular sent on request.

F. F. CALLAHAN, M.D., Medical Director

POKEGAMA, PINE COUNTY, MINN.

CHILDREN ADMITTED



LIKE THE TURNIP IN THE OLD FABLE THAT REQUIRED THE WHOLE HOUSEHOLD—INCLUDING THE MOUSE—TO UPROOT IT, FEW DISCOVERIES ARE UNEARTHED BY A SINGLE PERSON.

Thus Sterile Solution Adrenal Cortex Extract (Upjohn) had its roots in the accumulated knowledge of the past; through the work of a number of contemporary investigators the possibility of such a product was demonstrated; and finally, through the combined efforts of the research and production departments of The Upjohn Company, the extract was produced in commercial quantities. Sterile Solution Adrenal Cortex Extract (Upjohn) is available in 10 cc. rubber-capped vials at your prescription pharmacy.

ADRENAL CORTEX EXTRACT (UPJOHN)

FINE PHARMACEUTICALS SINCE 1886

Upjohn
KALAMAZOO MICHIGAN



Perhaps some overworked doctor would like to know . . .

. . . that Biolac is a complete liquid infant formula which saves you valuable time because there are no extra ingredients to be calculated.

. . . that Biolac provides completely for all nutritional needs of young infants except vitamin C.

. . . that prescribing Biolac reduces the possibility of upsets due to errors or contamination in formula preparation since it requires only simple dilution with boiled water as you direct.

NO LACK IN BIOLAC

Borden's complete infant formula

● *Biolac is prepared from whole milk, skim milk, lactose, Vitamin B_1, concentrate of Vitamins A and D from cod liver oil, and ferric citrate. It is evaporated, homogenized, and* sterilized. *For samples and professional information, write Borden's Prescription Products Div., 350 Madison Ave., New York City.*

A Strictly Ethical Line of Quality Vitamin Products



All Ulmer Quality Vitamin Products are manufactured under the most carefully supervised and controlled laboratory conditions. Nothing has been spared in making them the very finest quality. No attempt has been made to lessen their potency to meet popular over-the-counter prices; they conform to the maximum potency permitted by the War Production Board. The result is a strictly ethical line of Vitamin Products, outstanding in quality, which meet the rigid standards of the medical profession, and are prescribed and dispensed by the medical profession.

In addition to DA-LI-KAPS, VITAMIN B-COMPLEX and HEMATINIC OVALS, the Ulmer Vitamin line includes . . .

CAPSULES:

Vitamin A
Vitamin A and D
Vitamin D
Vitamin K
Vitamin A, B, C, D and G
Vitamin A, B, D and G
Calcium Pantothenate
Wheat Germ Oil (3 M Perles)

TABLETS:

Ascorbic Acid 50 mg.
Brewers Yeast
Nicotinic Acid 50 mg.
Riboflavin 1 mg.
Thiamine Hydrochloride 1 mg.
Thiamine Hydrochloride 3 mg.
Thiamine Hydrochloride 5 mg.
Wheat Germ Oil (Liquid)

The ULMER Quality Label

Is Your Protection

Write for complete information on any of these and other Ulmer products.

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.
MINNEAPOLIS MINNESOTA



Our compliments and sincere congratulations to the Minnesota State Medical Association, upon the Twenty-fifth Anniversary of

MINNESOTA MEDICINE

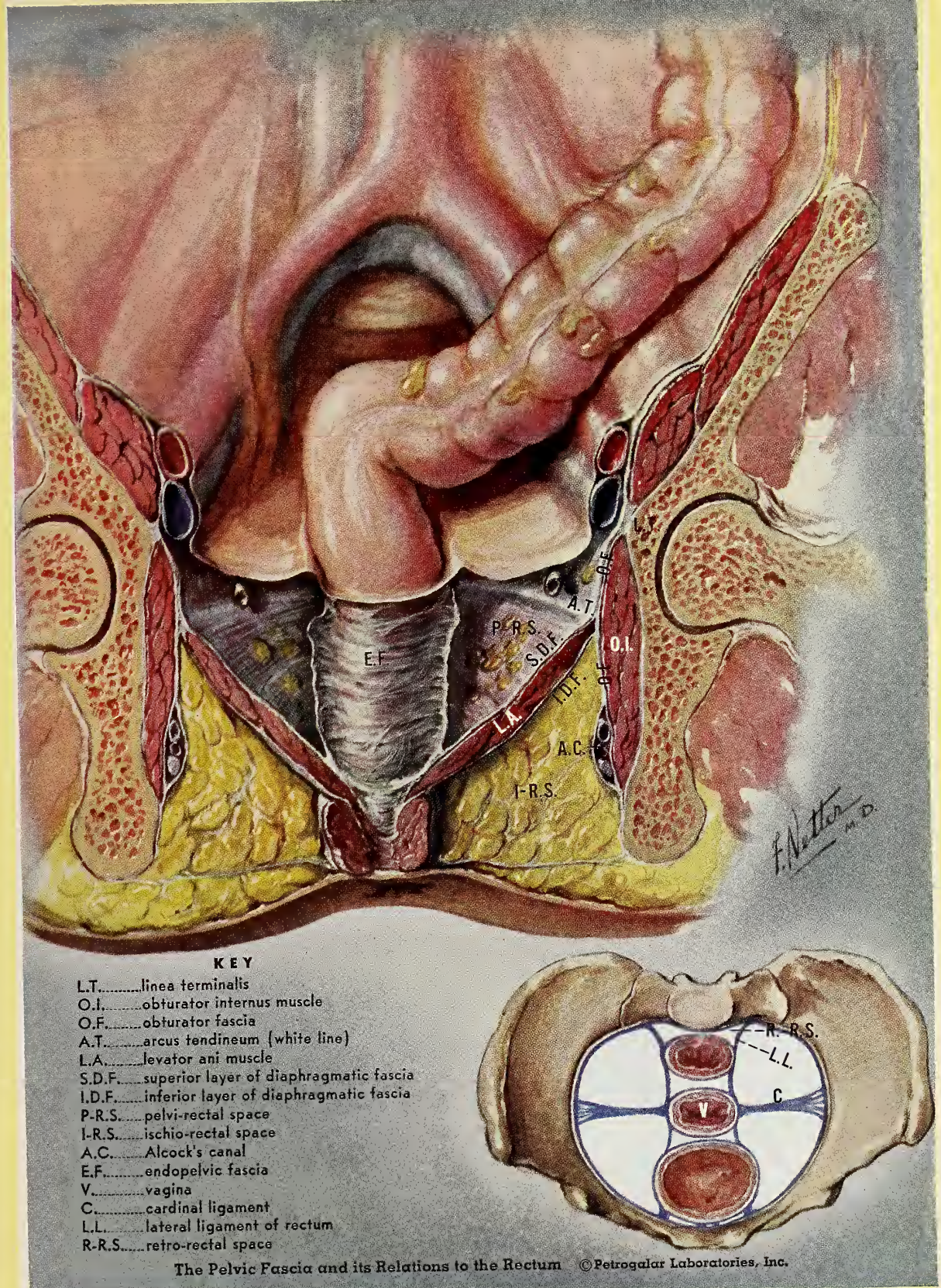
MINNESOTA MEDICINE has rendered a very valuable service to the medical profession of Minnesota. And, its recognition as one of the leading medical publications in the country, must be a source of satisfaction to every member of the Minnesota State Medical Association, as well as the editorial and business staffs.

May the next twenty-five years of your journalistic career be equally as successful and progressive!

AMERICAN NATIONAL BANK

OF SAINT PAUL

Member Federal Deposit Insurance Corporation



KEY

L.T.....linea terminalis
O.I.....obturator internus muscle
O.F.....obturator fascia
A.T.....arcus tendineum (white line)
L.A.....levator ani muscle
S.D.F.....superior layer of diaphragmatic fascia
I.D.F.....inferior layer of diaphragmatic fascia
P-R.S.....pelvi-rectal space
I-R.S.....ischio-rectal space
A.C.....Alcock's canal
E.F.....endopelvic fascia
V.....vagina
C.....cardinal ligament
L.L.....lateral ligament of rectum
R-R.S.....retro-rectal space

The Pelvic Fascia and its Relations to the Rectum ©Petrogalar Laboratories, Inc.

THE *Pelvic Fascia* AND ITS RELATIONS TO THE RECTUM

The fascia of the pelvis comprises three portions: the parietal, the diaphragmatic and the endopelvic fascia.

The parietal fascia lines the sides, back, and front of the pelvic cavity. The diaphragmatic fascia covers the upper and lower surfaces of the levator ani muscle in the pelvic floor. The endopelvic fascia (E.F.) invests the rectum and the other viscera.

Thus not only do the fascial sheets of the pelvis help support the rectum, but they also form closed fossae to which rectal

may place an undue burden upon the ligamentous and muscular supports of the bowel. In addition, the hardened fecal masses may irritate the bowel wall and allow infection to take hold that may involve the interfascial spaces.

Petrogalar* softens as well as lubricates the feces. This fine aqueous suspension of oil mixes intimately with the bowel residue, assuring a soft consistency that helps restore the natural evacuation impulse.

Petrogalar is palatable and easy to take. It does not become



Petrogalar*

Helps Establish "Habit Time!"

One to two tablespoonfuls of Petrogalar daily provide bland fluid to help soften the feces and bring about an easily passed, well-formed stool. Consider the routine use of Petrogalar to establish Habit Time. It is not habit-forming.



**Reg. U. S. Pat. Off. Petrogalar is an aqueous suspension of pure mineral oil each 100 cc. of which contains 65 cc. pure mineral oil suspended in an aqueous jelly.*

Petrogalar Laboratories, Inc. • 8134 McCormick Boulevard • Chicago, Illinois



THE ARMY-NAVY PRODUCTION AWARD

FOR *Excellence*

PATRIOTISM *practically applied* has been given the coveted recognition of our government for meritorious service to the Army and Navy. Our management and employees, members of the production forces behind the men who man the guns, are naturally filled with pride and are spurred to even greater effort, *to produce in increasing volume, to maintain highest standards, to deliver on time.* We pledge continued devotion to Our Country and to the conservation of the life and health of our armed forces and civilian population.

The symbol of distinguished service will wave from our flagstaff.
We shall strive to keep it flying.

Winthrop

CHEMICAL COMPANY, INC.

Pharmaceuticals of merit for the physician

NEW YORK, N. Y. WINDSOR, ONT.

WINTHROP

Minnesota State Medical Association

OFFICERS 1943

S. H. Baxter, M.D.	*President*	Minneapolis
J. F. Norman, M.D.	*First Vice President*	Crookston
F. W. Lynch, M.D.	*Second Vice President*	Saint Paul
B. B. Souster, M.D.	*Secretary*	Saint Paul
W. H. Condit, M.D.	*Treasurer*	Minneapolis
H. Z. Giffin, M.D.	*Past President*	Rochester
W. W. Will, M.D.	*Speaker, House of Delegates*	Bertha
E. A. Meyerding, M.D.	*Vice Speaker, House of Delegates*	Saint Paul
R. R. Rosell	*Executive Secretary*	Saint Paul

COUNCILORS*

First District
L. A. Buie, M.D. (1944) ..... Rochester

Second District
L. L. Sogge, M.D. (1944) ..... Windom

Third District
C. M. Johnson, M.D. (1943) ..... Dawson

Fourth District
A. E. Sohmer, M.D. (1945) ..... Mankato

Fifth District
E. M. Jones, M.D. (1943) ..... Saint Paul

Sixth District
A. E. Cardle, M.D. (1945) ..... Minneapolis

Seventh District
E. J. Simons, M.D. (1943) ..... Swanville

Eighth District
W. L. Burnap, M.D. (1945) (Chairman) .. Fergus Falls

Ninth District
F. J. Elias, M.D. (1944) ..... Duluth

HOUSE OF DELEGATES, AMERICAN MEDICAL ASSOCIATION*

Members

W. A. Coventry, M.D. (1944) ..... Duluth
A. W. Adson, M.D. (1944) ..... Rochester
F. J. Savage, M.D. (1943) ..... Saint Paul
J. M. Hayes, M.D. (1943) ..... Minneapolis

Alternates

J. C. Hultkrans, M.D. (1944) ..... Minneapolis
W. L. Burnap, M.D. (1944) ..... Fergus Falls
George Earl, M.D. (1943) ..... Saint Paul
W. W. Will, M.D. (1943) ..... Bertha

SCIENTIFIC COMMITTEES

COMMITTEE ON SCIENTIFIC ASSEMBLY

S. H. Baxter, M.D., General Chairman ..... Minneapolis
H. Z. Giffin, M.D. ..... Rochester
R. R. Rosell ..... Saint Paul

Section on Medicine

F. J. Hirschboeck, M.D. ..... Duluth
W. B. Roberts, M.D. ..... Minneapolis

Section on Surgery

J. M. Waugh ..... Rochester
H. W. Goehrs, M.D. ..... Saint Cloud

Section on Specialties

T. R. Fritsche, M.D. ..... New Ulm
J. R. Aurelius, M.D. ..... Saint Paul

Local Arrangements

R. R. Cranmer, M.D. ..... Minneapolis

COMMITTEE ON CANCER*

M. W. Alberts, M.D. (1944) ..... Saint Paul
J. K. Anderson, M.D. (1945) ..... Minneapolis
Charles Bolsta, M.D. (1943) ..... Ortonville
Herbert Boysen, M.D. (1943) ..... Madelia
O. J. Hagen, M.D. (1945) ..... Moorhead
E. C. Hartley, M.D. (1943) ..... Saint Paul
R. W. Koucky, M.D. (1943) ..... Minneapolis
F. H. Magney, M.D. (1945) ..... Duluth
J. R. Manley, M.D. (1944) ..... Duluth
Martin Nordland, M.D. (1945) ..... Minneapolis
W. T. Peyton, M.D. (1944) ..... University
W. C. MacCarthy, M.D., (Sr.) (1944) (ex officio) ... Rochester

*Terms expire December 31, of year indicated.

COMMITTEE ON FRACTURES

V. P. Hauser, M.D., General Chairman ..... Saint Paul

Executive Committee on Fractures

V. P. Hauser, M.D. ..... Saint Paul
N. H. Baker, M.D. ..... Fergus Falls
A. N. Collins, M.D. ..... Duluth
L. T. Davis, M.D. ..... Wadena
R. K. Ghormley, M.D. ..... Rochester
L. G. Rigler, M.D. ..... University
J. A. Thabes, M.D. (Jr.) ..... Brainerd
R. C. Webb, M.D. ..... Minneapolis
Nels Westby, M.D. ..... Madison
O. W. Yoerg, M.D. ..... Minneapolis

COMMITTEE ON INDUSTRIAL HEALTH

A. E. Wilcox, M.D. ..... Minneapolis
H. B. Allen, M.D. ..... Austin
L. S. Arling, M.D. ..... Minneapolis
Martin Aune, M.D. ..... Minneapolis
Richard Bardon, M.D. ..... Duluth
P. H. Bennion, M.D. ..... Saint Paul
R. B. Bray, M.D. ..... Biwabik
R. P. Caron, M.D. ..... Minneapolis
T. H. Dickson, M.D. ..... Saint Paul
T. A. Lowe, M.D. ..... South Saint Paul
J. L. McLeod, M.D. ..... Grand Rapids
C. M. Smith, M.D. ..... Duluth
H. G. Wood, M.D. ..... Rochester

COMMITTEE ON DIABETES

J. R. Meade, M.D. ..... Saint Paul
R. W. Cranston, M.D. ..... Minneapolis
C. N. Harris, M.D. ..... Hibbing
F. R. Huxley, M.D. ..... Faribault
Harry Oerting, M.D. ..... Saint Paul
A. A. Passer, M.D. ..... Olivia
B. F. Pearson, M.D. ..... Shakopee
E. H. Rynearson, M.D. ..... Rochester
R. V. Sherman, M.D. ..... Red Wing
C. J. Watson, M.D. ..... University

HEART COMMITTEE*

F. J. Hirschboeck, M.D. (1945)....Duluth
J. M. Adams, M.D. (1944)....Minneapolis
H. E. Binet, M.D. (1943)....Grand Rapids
C. A. Boline, M.D. (1943)....Battle Lake
P. G. Boman, M.D. (1945)....Duluth
C. S. Donaldson, M.D. (1944)....Foley
E. H. Frost, M.D. (1944)....Willmar
C. N. Hensel, M.D. (1943)....Saint Paul
Charles Koenigsberger, M.D. (1944)....Mankato
C. M. Robilliard, M.D. (1945)....Faribault
H. L. Smith, M.D. (1945)....Rochester
S. M. White, M.D. (1943)....Minneapolis

COMMITTEE ON SYPHILIS AND SOCIAL DISEASES

P. A. O'Leary, M.D....Rochester
C. A. Boreen, M.D....Minneapolis
B. T. Bottolfson, M.D....Moorhead
Edward Bratrud, M.D....Thief River Falls
J. M. Culligan, M.D....Saint Paul
C. D. Freeman, M.D....Saint Paul
W. E. Hatch, M.D....Duluth
H. G. Irvine, M.D....Minneapolis
S. E. Sweitzer, M.D....Minneapolis

COMMITTEE ON CONSERVATION OF HEARING

Horace Newhart, M.D....Minneapolis
L. R. Boies, M.D....Minneapolis
W. L. Burnap, M.D....Fergus Falls
C. E. Connor, M.D....Saint Paul
K. R. Fawcett, M.D....Duluth
F. E. Harrington, M.D....Minneapolis
H. I. Lillie, M.D....Rochester
E. A. Loomis, M.D....Minneapolis
H. A. Roust, M.D....Montevideo
J. T. Schlesselman, M.D....Mankato
Andrew Sinamark, M.D....Hibbing
G. E. Strate, M.D....Saint Paul
D. L. Tilderquist, M.D....Duluth
G. H. Walker, M.D....Winona
W. T. Wenner, M.D....Saint Cloud
L. M. Elstad (ex officio)....Faribault
H. E. Hartig (ex officio)....University

COMMITTEE ON OPHTHALMOLOGY

T. R. Fritsche, M.D....New Ulm
W. L. Benedict, M.D....Rochester
H. E. Binger, M.D....Saint Paul
W. E. Camp, M.D....Minneapolis
L. G. Dack, M.D....Saint Paul
F. P. Frisch, M.D....Willmar
J. S. Macnie, M.D....Minneapolis
V. I. Miller, M.D....Mankato
L. W. Morsman, M.D....Hibbing
G. H. Walker, M.D....Winona
W. T. Wenner, M.D....Saint Cloud

COMMITTEE ON HOSPITALS AND MEDICAL EDUCATION

H. S. Diehl, M.D....University
D. C. Balfour, M.D....Rochester
Moses Barron, M.D....Minneapolis
S. H. Boyer, M.D. (Sr.)....Duluth
A. F. Branton, M.D....Willmar
A. R. Colvin, M.D....Saint Paul
H. C. Cooney, M.D....Princeton
C. C. Kennedy, M.D....Minneapolis
C. I. Oliver, M.D....Graceville
W. H. Valentine, M.D....Tracy
W. A. O'Brien, M.D. (ex officio)....University

COMMITTEE ON PUBLIC HEALTH NURSING

C. A. Scherer, M.D....Duluth
W. C. Chambers, M.D....Blue Earth
T. F. Hammermeister, M.D....New Ulm
F. E. Harrington, M.D....Minneapolis
E. Haugseth, M.D....Twin Valley
H. L. Lamb, M.D....Little Falls
G. H. Mesker, M.D....Olivia
C. W. Simison, M.D....Hawley
F. M. Manson, M.D. (ex officio)....Worthington

COMMITTEE ON MATERNAL HEALTH

R. J. Moe, M.D....Duluth
R. N. Andrews, M.D....Mankato
T. J. Devereaux, M.D....Wayzata
A. D. Hoidale, M.D....Tracy
A. B. Hunt, M.D....Rochester
F. J. Kucera, M.D....Hopkins
R. T. LaVake, M.D....Minneapolis
J. C. Litzenberg, M.D....Minneapolis
J. L. McKelvey, M.D....University
D. E. Morehead, M.D....Owatonna
J. J. Swendson, M.D....Saint Paul

*Terms expire December 31, of year indicated.

COMMITTEE ON MEDICAL TESTIMONY

E. M. Hammes, M.D....Saint Paul
B. S. Adams, M.D....Hibbing
H. B. Annis, M.D....Minneapolis
L. A. Barney, M.D....Duluth
G. R. Dunn, M.D....Minneapolis
J. F. Norman, M.D....Crookston
W. G. Workman, M.D....Tracy

COMMITTEE ON CHILD HEALTH

R. L. J. Kennedy, M.D....Rochester
L. R. Critchfield, M.D....Saint Paul
H. F. Helmholz, M.D....Rochester
R. J. Josewski, M.D....Stillwater
Elizabeth C. Lowry, M.D....Minneapolis
E. E. Novak, M.D....New Prague
M. J. Nydahl, M.D....Saint Paul
Lillian L. Nye, M.D....Saint Paul
L. F. Richdorf, M.D....Minneapolis
M. J. Shapiro, M.D....Minneapolis
Irvine McQuarrie, M.D. (ex officio)....University

COMMITTEE ON MILITARY AFFAIRS

Col. F. L. Smith....Rochester
Lt. Col. J. J. Catlin....Buffalo
Major M. G. Gillespie....Duluth
Major Z. E. House....Cass Lake
Lt. Col. R. B. Hullsiek....Saint Paul
Col. R. T. Knight....Minneapolis
Lt. Col. J. J. Morrow....Austin
Lt. C. S. Strathern....Saint Peter
Lt. Col. W. G. Workman....Tracy

HISTORICAL COMMITTEE

M. C. Piper, M.D....Rochester
H. B. Annis, M.D....Minneapolis
Olga Hansen, M.D....Minneapolis
F. R. Huxley, M.D....Faribault
W. L. Palmer, M.D....Albert Lea
C. L. Scofield, M.D....Benson
G. E. Sherwood, M.D....Kimball
F. P. Strathern, M.D....Saint Peter
J. A. Thabes, M.D. (Sr.)....Brainerd
E. L. Tuohy, M.D....Duluth
J. M. Armstrong, M.D. (ex officio)....Sant Paul

COMMITTEE ON VACCINATION AND IMMUNIZATION

E. J. Huenekens, M.D....Minneapolis
A. J. Chesley, M.D....Saint Paul
D. A. Dukelow, M.D....Minneapolis
E. C. Gaines, M.D....Buffalo Lake
F. E. Harrington, M.D....Minneapolis
W. W. Higgs, M.D....Park Rapids
H. M. Keith, M.D....Rochester
C. O. Kohlbry, M.D....Duluth
R. B. J. Schoch, M.D....Saint Paul
F. P. Strathern, M.D....Saint Peter

COMMITTEE TO STUDY PSYCHOPATHIC PERSONALITIES

G. R. Kamman, M.D....Saint Paul
A. G. Dumas, M.D....Minneapolis
R. C. Gray, M.D....Minneapolis
J. C. McKinley, M.D....University
J. C. Michael, M.D....Minneapolis
F. P. Moersch, M.D....Rochester
A. S. Nissen, M.D....Duluth
W. L. Patterson, M.D....Fergus Falls
M. C. Petersen, M.D....Rochester
G. N. Ruhberg, M.D....Saint Paul

COMMITTEE ON FIRST AID AND RED CROSS

J. S. Lundy, M.D....Rochester
H. R. Anderson, M.D....Deer River
L. C. Barr, M.D....Albert Lea
E. S. Boleyn, M.D....Stillwater
C. J. Potthoff, M.D....University
W. W. Rieke, M.D....Wayzata
C. B. Teisberg, M.D....Saint Paul

COMMITTEE ON TUBERCULOSIS

J. A. Myers, M.D....Minneapolis
W. H. Aurand, M.D....Minneapolis
H. A. Burns, M.D....Saint Paul
S. S. Cohen, M.D....Oak Terrace
K. A. Danielson, M.D....Litchfield
L. H. Flancher, M.D....Minneapolis
E. K. Geer, M.D....Saint Paul
G. A. Hedberg, M.D....Nopeming
A. J. Henderson, M.D....Kiester
R. R. Hendrickson, M.D....Lake Park
H. C. Hinshaw, M.D....Rochester
E. A. Meyerding, M.D....Saint Paul
K. H. Pfuetze, M.D....Cannon Falls
C. L. Scofield, M.D....Benson
S. A. Slater, M.D....Worthington
W. H. Feldman, (ex officio)....Rochester

NON-SCIENTIFIC COMMITTEES

COMMITTEE ON PUBLIC POLICY

L. L. Sogge, M.D. ..... Windom
G. I. Badeaux, M.D. ..... Brainerd
L. A. Barney, M.D. ..... Duluth
J. F. DuBois, M.D. ..... Sauk Center
E. A. Eberlin, M.D. ..... Glenwood
W. A. Fansler, M.D. ..... Minneapolis
R. C. Gray, M.D. ..... Cambridge
H. C. Habein, M.D. ..... Rochester
J. M. Hayes, M.D. ..... Minneapolis
M. O. Oppegaard, M.D. ..... Crookston
W. C. Rutherford, M.D. ..... Saint Paul
H. R. Tregilgas, M.D. ..... South Saint Paul

INTERPROFESSIONAL RELATIONS COMMITTEE

F. J. Savage, M.D. ..... Saint Paul
C. C. Allen, M.D. ..... Austin
E. C. Bayley, M.D. ..... Lake City
J. J. Catlin, M.D. ..... Buffalo
E. E. Christensen, M.D. ..... Winona
C. O. Estrem, M.D. ..... Fergus Falls
O. O. Larsen, M.D. ..... Detroit Lakes
C. W. Mayo, M.D. ..... Rochester
W. L. Palmer, M.D. ..... Albert Lea
A. A. Passer, M.D. ..... Olivia
C. E. Proshek, M.D. ..... Minneapolis
C. E. Rea, M.D. ..... Saint Paul

COMMITTEE ON UNIVERSITY RELATIONS

H. Z. Giffin, M.D. ..... Rochester
B. J. Branton, M.D. ..... Willmar
B. S. Adams, M.D. ..... Hibbing
George Earl, M.D. ..... Saint Paul
J. M. Hayes, M.D. ..... Minneapolis

EDITING AND PUBLISHING COMMITTEE*

E. M. Hammes, M.D. (1946) ..... Saint Paul
P. F. Donohue, M.D. (1943) ..... Saint Paul
H. W. Meyerding, M.D. (1944) ..... Rochester
B. O. Mork, M.D. (Jr.) (1946) ..... Worthington
C. L. Oppegaard, M.D. (1945) ..... Crookston
T. A. Peppard, M.D. (1947) ..... Minneapolis
H. A. Roust, M.D. (1943) ..... Montevideo
O. W. Rowe, M.D. (1947) ..... Duluth
A. H. Wells, M.D. (1944) ..... Duluth
H. L. Ulrich, M.D. (1945) ..... Minneapolis

COMMITTEE ON PUBLIC HEALTH EDUCATION

E. L. Tuohy, M.D., General Chairman ..... Duluth

Executive

E. L. Tuohy, M.D. ..... Duluth
R. M. Burns, M.D. ..... Saint Paul
R. M. Hewitt, M.D. ..... Rochester
F. H. Magney, M.D. ..... Duluth
Chairmen of all Scientific Committees

Radio

R. M. Burns, M.D. ..... Saint Paul
J. K. Anderson, M.D. ..... Minneapolis
M. J. Anderson, M.D. ..... Rochester
R. N. Andrews, M.D. ..... Mankato
Elizabeth C. Bagley, M.D. ..... Duluth
P. M. Gamble, M.D. ..... Albert Lea
E. A. Heiberg, M.D. ..... Fergus Falls
R. N. Jones, M.D. ..... Saint Cloud
E. N. Peterson, M.D. ..... Virginia
E. D. Risser, M.D. ..... Winona

Speakers Bureau

F. H. Magney, M.D. ..... Duluth
R. M. Burns, M.D. ..... Saint Paul
L. A. Hilger, M.D. ..... Saint Paul
P. J. Hiniker, M.D. ..... Le Sueur
P. A. Lommen, M.D. ..... Austin
J. F. Norman, M.D. ..... Crookston
R. C. Radabaugh, M.D. ..... Hastings
C. P. Robbins, M.D. ..... Winona
T. W. Weum, M.D. ..... Minneapolis

Editorial

R. M. Hewitt, M.D. ..... Rochester
R. P. Buckley, M.D. ..... Duluth
G. W. Clifford, M.D. ..... Alexandria
T. J. Edwards, M.D. ..... Saint Paul
W. W. Spink, M.D. ..... University

*Terms expire December 31, of year indicated.

COMMITTEE ON MEDICAL ECONOMICS

George Earl, M.D., General Chairman ..... Saint Paul

Executive

George Earl, M.D. ..... Saint Paul
A. W. Adson, M.D., Vice Chairman ..... Rochester
R. D. Mussey, M.D. ..... Rochester
W. A. Coventry, M.D. ..... Duluth
W. H. Hengstler, M.D. ..... Saint Paul
F. A. Olson, M.D. ..... Minneapolis
L. L. Sogge, M.D. ..... Windom
T. H. Sweetser, M.D. ..... Minneapolis
E. L. Tuohy, M.D. ..... Duluth

Editorial

George Earl, M.D. ..... Saint Paul
W. F. Braasch, M.D. ..... Rochester
A. N. Collins, M.D. ..... Duluth
J. M. Hayes, M.D. ..... Minneapolis
F. J. Savage, M.D. ..... Saint Paul

Medical Ethics

R. D. Mussey, M.D. ..... Rochester
B. S. Adams, M.D. ..... Hibbing
H. S. Diehl, M.D. ..... University

Medical Advisory

W. H. Hengstler, M.D., Chairman ..... Saint Paul
B. J. Branton, M.D. ..... Willmar
Ivar Sivertsen, M.D. ..... Minneapolis

State Health Relations

T. H. Sweetser, M.D. ..... Minneapolis
E. S. Boleyn, M.D. ..... Stillwater
W. S. Broker, M.D. ..... Wadena
J. N. Dunn, M.D. ..... Saint Paul
C. L. Haney, M.D. ..... Duluth
R. R. Heim, M.D. ..... Minneapolis
C. M. Johnson, M.D. ..... Dawson
D. E. McBroom, M.D. ..... Cambridge
J. P. McDowell, M.D. ..... Saint Cloud
J. L. McLeod, M.D. ..... Grand Rapids
S. A. Slater, M.D. ..... Worthington

Low Income and Indigent Problems

W. A. Coventry, M.D. ..... Duluth
M. W. Binger, M.D. ..... Rochester
J. A. McIntyre, M.D. ..... Owatonna
I. L. Oliver, M.D. ..... Graceville
C. L. Oppegaard, M.D. ..... Crookston
C. A. Saffert, M.D. ..... New Ulm
C. L. Sherman, M.D. ..... Luverne
L. I. Younger, M.D. ..... Winona
A. H. Zachman, M.D. ..... Melrose

Sickness Insurance

A. W. Adson, M.D. ..... Rochester
R. R. Cranmer, M.D. ..... Minneapolis
J. E. Crewe, M.D. ..... Rochester
V. P. Hauser, M.D. ..... Saint Paul
F. J. Hirschboeck, M.D. ..... Duluth
F. R. Hirshfield, M.D. ..... Minneapolis
O. W. Holcomb, M.D. ..... Saint Paul
E. W. Johnson, M.D. ..... Bemidji
C. B. McKaig, M.D. ..... Pine Island
C. A. McKinlay, M.D. ..... Minneapolis
J. L. Mills, M.D. ..... Winnebago
O. I. Sohberg, M.D. ..... Saint Paul
W. W. Will, M.D. ..... Bertha

Industrial and Contract Practice

F. A. Olson, M.D. ..... Minneapolis
A. M. Aanes, M.D. ..... Red Wing
N. H. Baker, M.D. ..... Fergus Falls
C. C. Chatterton, M.D. ..... Saint Paul
W. H. Cole, M.D. ..... Saint Paul
G. R. Dunn, M.D. ..... Minneapolis
M. S. Henderson, M.D. ..... Rochester
Clarence Jacobson, M.D. ..... Chisholm
O. L. McHaffie, M.D. ..... Duluth
R. F. McGandy, M.D. ..... Minneapolis
E. N. Peterson, M.D. ..... Eveleth
C. M. Smith, M.D. ..... Duluth

MINNESOTA STATE CERTIFICATION BOARD ON PUBLIC HEALTH NURSING

F. J. Savage, M.D. ..... Saint Paul



War Paint

In the midst of the blitz in England a lipstick became a symbol of democracy, bravely worn in defiance of that "wicked man's" attempt to shatter morale. Early in the history of the U. S. S. R. women protested against a ban on cosmetics, and it was lifted. These things are easy to understand when one reflects that cosmetics are an intimate part of a woman's life. They are essential to her well-being, her sense of personal fitness. When a woman knows she looks pretty she can face almost any situation with equanimity and courage. She needs her "war paint"; it bolsters her morale. During the telling months ahead our industry may be deprived of certain raw materials. Packages and containers may have to be changed. Any great emergency is a test of resourcefulness. We believe that our industry will not be found lacking in that sterling American quality. Our research facilities are directed towards finding alternative raw materials that will be at least as satisfactory as those they replace. Come what may, we'll do our best to continue to supply American women with those aids to good grooming, those props to personality, that in their modest way contribute so much to national morale.

Luzier's Fine Cosmetics and Perfumes Are Distributed In Minnesota By:

District Distributors

Louise Roberts
304 Medical Arts Bldg.
Minneapolis, Minn.

Emma von Domarus
610 3rd St. S.E.
Little Falls, Minn.

Mae Nagle
Ormonde Hotel
Virginia, Minn.

Kay McCarthy
Fairmont, Minn.

Assistant District Distributor

Eva von Domarus
610 3rd St. S.E.
Little Falls, Minn.

Cornerstones



ONLY THROUGH ABILITY TO ESTABLISH AND MAINTAIN HIGH STANDARDS AND TO CONTRIBUTE NEW AND USEFUL PRODUCTS FOR THE CONTROL OF DISEASE CAN A PHARMACEUTICAL MANUFACTURER BECOME A HELPFUL FACTOR IN WORLD MEDICINE

ELI LILLY AND COMPANY

FOR THE PHYSICIAN'S PRESCRIPTION · Lilly ·

PRINCIPAL OFFICES AND LABORATORIES, INDIANAPOLIS, INDIANA, U. S. A.

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 January, 1943 No. 1

PROGRESS IN INTERNAL MEDICINE IN MINNESOTA

E. L. TUOHY, B.A., M.D., F.A.C.P.
Duluth, Minnesota

MY assignment for this issue of MINNESOTA MEDICINE is the development of the specialty of Internal Medicine in our state. Other specialties are receiving similar treatment for the general purpose of giving a review of the quarter-century now ending in which this journal has so well served our profession. I choose to discuss the *background* of internal medicine in Minnesota. Documented reviews are regularly published in various journals, giving the year's progress not only in the field of general medicine but for such subdivisions as cardiology and gastroenterology, and we have such splendid reviews as that on arthritis* prepared by the committee studying that intricate problem. These articles and year books are available to everyone. It may orient the reader the better if I give the following reasons or purposes for this type of review:

1. The internist cannot avoid the responsibility of keeping in step with all advances in diagnosis and treatment wherever they appear.

2. I shall aim to point out, therefore, that he is well adapted to be the special integrator for coördinating group opinion and interpreting it for the benefit of the individual patient.

3. Much is said about the "science of medicine"; more of what has been accomplished in mass disease prevention (public health). But as life prolongation has obtained, the individual obtrudes as a social unit. The years are apt to bestow upon him more infirmities than blessings; he faces more and more hurdles of disease, degeneration, accidents, economic and nutritional imbalance. The list has infinite variety; each generation meets these with the physical and philosophical antidotes the period accepts from the past and currently develops.

4. For the forty years of my contact with medicine in Minnesota I say unreservedly there has been no "lag" whatever in giving our population the prompt benefit of all medical discoveries. In fact, we accept a general reputation the equal of any state in the Union. We have met our local obligations, and one of our great Minnesota institutions has given itself to the world and accepted its acclaim. Therefore, in terms of *our* people they expect little short of the miraculous.

5. Napoleon, surveying his victorious generals reporting to him their accomplishments, is said to have replied, "And what did you do the next day?" For those of us reporting about our specialties it should in some measure put us in our places. Success is another name for "capacity at re-adaptation." Let us keep that in mind.

6. For example, we should put much stress upon the medical problems that an age shift in population (geriatrics) imposes. Our massed action against epidemic and contagious diseases has been as effective as anywhere. But the hazards of degeneration, malignancy and many infectious processes remain. Most of all, the perturbed consciousness turns to science with something like the role of Lazarus at the rich man's door. We cannot bury our psychoneurotics and resurrect them to an effectiveness.

7. I wish to review the accomplishments of our guild in a period long enough after Virchow

From the Department of Medicine, The Duluth Clinic, Duluth, Minnesota.

*Hench, P. S., et al.: Rheumatism and arthritis: Review of American and English literature for 1940. Ann. Int. Med., 15: 1002-1108, (Dec.) 1941.

and Pasteur to have escaped the hardships of accommodation to their monumental discoveries, and to profit vastly by the flood of understanding that came with them. Ours has been the medical era of bacterial causation and pathological anatomical imprints. We never need to apologize for it, despite the fact that it bestowed upon medicine materialistic attitudes. I wish to sketch an outlook for physiology and its allied sciences. A great field of research and clinical application of therapy comparable to the sulfa drugs is opening up.

8. I shall name some of the men of my own time to whom our indebtedness is deep and abiding. Most of all, I wish to make recurring references to the very gifted Frank Fairchild Wesbrook, whose stirring picture* I transfer to these pages. The personal debt many of us owe him—the public debt we all owe him—has not been appropriately acknowledged. He deserves a far better Boswell than my powers provide.

Internal medicine has attained a very high standing in Minnesota. Surgery led other fields of medicine in the first two decades of this century. Gradually internal medicine has come into a dominant position.† Let me hasten to add that this has not come through unusual aggression by those in the field, but rather through a yielding on the part of surgeons to the conviction that surgery and medicine are based alike upon the fundamental sciences and upon accurate diagnoses. It is only in the decision as to whether treatment entails some operative technique, in whole or in part, or whether bloodless methods suffice. The closer and complementary association of the two basic specialties has thus come about; and this has not come to pass alone in such group clinics as at Rochester, but in all teaching, general and special hospital staffs as well. The recent exploits in California of an unlicensed but technically trained orderly found operating quite successfully (and voraciously) upon a variety of patients should convince any skeptic that technical skill alone does not produce a competent surgeon. In like manner, an internist critical of and unversed in the possibilities of operative surgery and the time and place for its exposition when indicated, is incompetent in this specialty no matter how erudite he may be or accurate in his diagnoses. These principles apply to all the specialties, as I shall later comment upon. Most good general practitioners of medicine are really internists, and the reverse holds equally. They should be the first to pass upon most chronic disabilities of adults and many acute disorders as well. This job of being a clearing house for other specialties may, however, be neither profitable nor comforting where the public too avidly adopts specialism and the specialist is so lacking in inhibitory faculties that it may not be easy to distinguish him from the California orderly. So much for definitions and delineations.

Regimentation and Medical Assignment

We are occasionally reminded of the chagrin of some of our brethren in the armed forces who are delegated to nonmedical or "book work" duties. In the face of military emergencies this seems inevitable; but in the broader sense it is only one aspect of the general regimentation that comes to all business and vocations where a "planned economy" supervenes, regardless of its type or source. Laymen (social workers or otherwise) are not intrinsically despicable simply because they would wish to see all our medical work organized in mass moves at eradication of any material or emotional (soma or psyche) obstacle that obtrudes in their devisement of an economic Utopia. In fact, such mass action under our own guidance has gone a long way in the eradication of communicable disease (diphtheria, smallpox, typhoid, malaria). Institutionalizing the tuberculous has greatly limited that scourge; it has done little, however, to check mental disease; and veterans' hospitals are for the most part doing no better with the high percentage of their anxiety-oppressed patrons. Not a few of these use their afflictions as a shield against adversity and the hospitals as a dietetically ideal parking lot.*

The internist cannot afford to conclude that any complainer's afflictions are "functional" until he has proven by painstaking routine that objective disease may not be a factor, but various estimates agree that where this care is taken at least 75 per cent of our patients are functionally disordered and mass attempts at their cure offer

*This photograph is taken from "Forty Years of the University of Minnesota." It was edited by the late W. W. Folwell, and published by the General Alumni Association in 1910.

†Staff Meeting Bulletin, Hospitals of the University of Minnesota, p. 393, June 5. 1942.

*This must not be construed as any criticism of the medical staffs of these hospitals. Where medical service is contingent upon any other factor than the individual physician's decision then those with subjective distress abuse the privilege and burden the system.

ittle. The records of most charitable dispensaries ield the proof of that statement. For one item, here is so little of the opportunity at *integration* n the part of some well-poised guide whose urpose it is to assemble the findings of all tests nd specialists in the manner so well outlined y Professor Barker of Johns Hopkins. I introluce this statement for two reasons: (1) because t touches to the core the matter of the abuses f excessive specialism; and (2) because the inernist is by necessity as well as training the best ntegrator. I propose to discuss the route by which most men of this period have attained the specialty of internal medicine. Some of the younger men entering the profession may be interested. It gives me an opportunity to introduce to them certain personalities to whom they are deeply indebted, albeit in the current of their hasty and turbulent training there is little opportunity to give them much of an immediate not to say remote historical background. Specialties in medicine are with us to stay. Those entering into the specialties must not delay their preparation too long. The more cloistered and limited the field, the less need there may be for a broad foundation. A. J. Carlson's comment is, as always, very thought-provoking: "The conscientious practise of modern medicine is becoming so complicated and costly as to almost *exceed the intellectual capacity of the ablest men.* Again I see no cure for this. Who shall bear the necessarily increased cost of modern medical service, the individual or society? I do not know the wisest way." No, indeed. They say we are fighting two wars: a horizontal global war, which we shall win; and a vertical class and racial war, the end of which awaits a millennium. Society is not likely to accept our past record (notable as it is) in yielding to us a continuance of our rugged individualism. In the matter of life prolongation, elimination of preventable disease, promotion of individual comfort and efficiency, we have established indeed a challenging record. Science has found in its linkage with medicine one of its greatest agencies for man's beneficence. When we speak of freedom we must never forget that the freedom of the will has been guaranteed by a higher authority than any court or ruler. Men go neither to heaven nor to hell in mass groups. Kipling put it: "The sins they do by two and two, they must pay for one by one." No specialty within medicine, with the single exception of neuropsychiatry, demands such a broad understanding of the human consciousness as does internal medicine. Routine procedures, impersonal approaches, are consonant with problems of epidemic or military necessity. Surgery began with the treatment of war emergencies (Ambroise Paré). War has always advanced the surgical field; internal medicine thrives on periods of peace. There is the need of reflection—philosophical periods of retreat (Osler). The "natural born internist" does not exist. He comes into his greatest usefulness when he scans the current medical literature with unflagging zeal, when he sharpens his own powers of observation thereby, and when he has had enough contact with the classics* so that he finds peace and relaxation in rereading his own favorites. If he qualifies under these headings we may well permit him to venture the thrombosis of his own coronaries through misguided physical exertion for which he is untrained but which yields him rare delight.

Great Medical Personalities In Minnesota

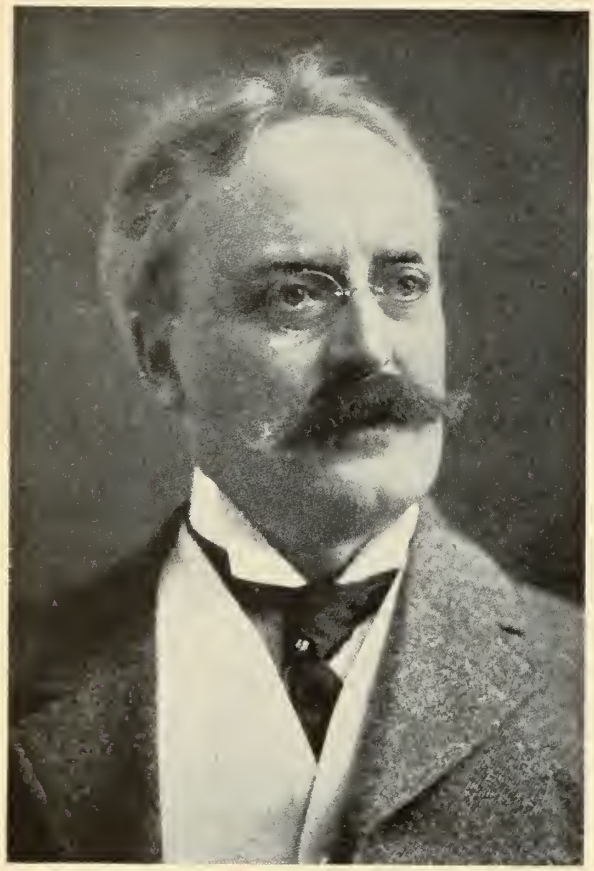
I choose to go back only to the period of my own tutelage, where my own contacts furnish the material. I trust this comment† may secure for me some indulgence and rescue me from the opprobrium of autobiographical verbosity.

Charles P. Sigerfoos had a profound influence upon those of us who took our academic training at Minnesota. He taught biology, and led classes in zoology, physiology and embryology. Since the microscope became such an important instrument for research in medicine and establishing better clinical diagnosis, this great teacher deserves particular mention, although he never had any direct contacts with the Minnesota medical faculty. I think I am right in stating that Hal Downey secured his urge and began the development of his interests within Sigerfoos' department; and everyone knows of his great contributions in the field of hematology, begun when he was a relatively young man. Scores of others, like myself, at least were introduced to a world of interest opened up by the microscope; we were made ready for the grounding in microscopical pathology that was later available. Twenty years slipped by, however, before the con-

*Under the term "classics" should be catalogued many resources other than books or essays. Many pay lip service to Cervantes, Bacon, Shakespeare and Montaigne; but never read them. The American Physicians Art Association held an exhibit at the A.M.A. meeting in Atlantic City in June, 1942. There are several doctors' orchestras and a great many nonplayers are arch collectors of symphonic records.

†And save me from censure for leaving out the names of so many equally deserving.

sciousness dawned upon me of the influence that that charming, punctilious and precise educator, Professor Sigerfoos, had upon me. Many others have expressed to me the same feeling of sincere devotion to that rare teacher.



Frank Fairchild Wesbrook

The question is often posed by anxious parents: "What is the best choice of subjects for those hoping to matriculate in medicine?" The inquiry is not easily answered. Studies such as I have mentioned above certainly molded and prepared me. Perhaps, however, in my philosophical moments I am replaying some of the memory records grooved by contact with the beloved and gracious Maria Sanford; or I am disking from a matinee with that vivid genius of psychology, Harlow Gale; or a rollicking chant with the gifted "Dickie" Burton—he never to be forgotten—his Shakespearian course gone to mold along with the dim recollections of Henry Irving and Walker Whiteside. After 1914 and 1929, despite attempts at playing the old records, I was able to reproduce only an occasional strain of Anderson's facile historical cataloguing of the countries in continental Europe; and some figures by economist McVeigh—methodical social and political balances; but need I add that much has happened to European schedules and the world's economic stability since the above fateful years were ushered in?

Frank Fairchild Wesbrook

I consider that Wesbrook was responsible, more than any other man, living or dead, for medical undergraduate teaching in Minnesota. He was the most attractive personality I have ever met. I admit at once that in so far as he is concerned I am guilty of hero worship. In many ways I have no right to claim him for the specialty of internal medicine, because he obviously was primarily a bacteriologist and pathologist; nevertheless, as I scan the period of approximately a quarter-century since his death in 1918, I conscientiously feel that the ideals and schedules of teaching, the correlation of all forces for the control and the alleviation of disease were all a part of his superb consciousness. Long before others grasped the idea of one medical school within our state, attached to our university not as an appendage but as a living, active, dynamic force therein, he blueprinted the prospective development of our medical school—an accomplishment we now so proudly survey. Too little has been said about this great man and this lovable character. This was brought home to me forcefully a few years ago when a teacher here for a short period asked me on occasion something like this: "Who was this man Wesbrook about whom so much is said and who seems to have left so little in the way of research?" I felt no resentment at this remark; I hope I did not show it. But a great nostalgia came over me, out of the feeling that after all this inquirer, bent chiefly toward research problems and output, was right. No one ever desired more eagerly and wistfully to devote his life to research than did this glorious individual who, in 1906, became the dean of the College of Medicine and Surgery at Minnesota, and held that post until January, 1913, when he was made president of British Columbia University. For the sake of the records I beg leave to give you a short résumé of Wesbrook's life.*

*I have secured the details pertaining to Wesbrook's earlier years from his brother Donald. Donald and Beth Wesbrook are now living in East Barnard, Vt. When the Wesbrooks came to Minneapolis the much younger brother Donald lived with them. He ultimately graduated in engineering at Minnesota. He married Beth Barney, daughter of a well-known family in southeast Minneapolis.

Canadian born, July 12, 1868, he had coursed through his preliminary training (London, Ontario, and Winnipeg, Manitoba) and had attained a B.A. degree when he was only nineteen. Three years later he had an M.A., an M.D. and C.M. from Manitoba University. He had had an internship and a short period as a railroad surgeon at Banff, Alberta, and found himself a year later taking the famous maternity course at the Rotunda Hospital in Dublin. Perhaps this item explains why, when I first met him, fellow faculty members called him "Paddy." Something else came up, however, and the next three years found him doing research in pathology at Caius College, Cambridge. He had secured and won the John Lucas Walker fellowship. He spent three years thereafter gaining further experience in the King's College and St. Bartholomew's hospitals in London, and spent considerable time in Germany, particularly at Marburg. In this period he had many continental contacts, to which he often referred. He met the great researchers of that post-Virchow and Michael Foster period; he brought back with him to Canada in 1896 that Promethean medical fire that so many others like him have spread around the world and so continue to do. His own university (Manitoba) gave him the call for the professorship in pathology. He did not remain very long in Winnipeg because he was called soon thereafter to become professor of pathology and bacteriology and public health at Minnesota. He had, however, taken time to marry the daughter of Sir Thomas and Lady Taylor. Sir Thomas was chief justice of the supreme court of Manitoba.

This is just a recital of who he was and where he had been, but that succession of dates and appointments does not reveal the man. Anyone observing him swinging across the campus would not need to be told that he had won medals at home and in England for proficiency in running, jumping, pole vaulting, bicycle riding, shotputting, as well as both single and shell crew rowing. When I knew him best he was a member of the Athletic Board of Control. He was the most gracious of hosts and the most charming of companions; but let no student ever presume upon such acquaintance as these opportunities might bestow as an occasion for any letdown of the standard he set within his departmental teaching. He would swing into the lecture room with an agility reminiscent of his pole vaulting; for a few moments he would vault into his prepared lecture, but like many geniuses he was apt to wander off on other sidelines, promoting considerable confusion in the student's notes. If one was able to catch some of these sidelines and his enthusiasm that was enough. Some of the best lecturers, after all, are the poorest teachers. Well, wherever Wesbrook joined any group he soon became the center of animated conversation. His clothes always fitted him well but were never ostentatious; he kept himself well groomed. He was a connoisseur of meerschaum pipes. He allowed his friends (and others) to take up a great deal of his time. He was a gentleman to the core, and he acted the part even toward those whom he did not like. As a result of all this and of his official position he was placed upon endless committees and faculty appointments. No assignment of this type ever became so onerous (and so productive of good) as his directorship of the laboratories of the Minnesota State Board of Health. The late H. M. Bracken, Secretary of the Board, lived but a few doors away from him (near Tenth Avenue Southeast, Minneapolis). It was Wesbrook and Bracken who sent me to Duluth in the summer of 1905 to open the branch laboratory for the State Board of Health at St. Mary's Hospital. I was soon to learn why Frank Wesbrook was never to be granted any time to do that research for which he was so superbly fitted when he came back from Europe to Canada when he was only twenty-nine years old. The research opportunity which he so much craved has since fallen into the most competent hands of such workers as Cecil Watson and Wesley Spink. He would be immensely proud of them, even as we all are. But, Minnesota was pioneering medically. Great general surgeons were developing at Rochester; Minnesota had great clinical teachers, but aside from those like Louis Nippert and Arnold Schwyzer (European trained) they were mostly trained in the Osler tradition, and lacked his contact with the clinical laboratory and the postmortem table. Minnesota might also have boasted of rollicking adventures with smallpox, a typhoid rate that competed for ascendancy with any in America, and aside from a lone protesting voice, such as that of Longstreet Taylor of Saint Paul, tuberculosis, with its terrifying incidence among young adolescents, was accepted everywhere,

even as the Indians had accepted it after the white man came.

H. M. Bracken was indefatigable. In his official position as secretary of the State Board of Health he kept Wesbrook in a stew a large part of the time bolstering up his blitzkrieging officialdom. And yet, let me add at once, Bracken was usually right. He had had some experience before the mast. He absorbed no profanity from this service, but others took the incentive thereto from him. Wesbrook, the diplomat, spent precious hours and days mollifying people to whom Secretary Bracken had sent blistering letters, presently reminiscent of a cabinet member in Washington who, among a thousand other aggrandized duties, is custodian for the Indians. Like the present cabinet member in Washington, Bracken† was noted for his bluntness more than for his obvious knowledge of the possibilities of public health.

Frank Wesbrook left medicine to accept the presidency of a university (still largely in prospect) when he was only forty-five years old. He died of hypertensive cardiovascular disease at fifty. I have had much to do with treating hypertensives. For three years now statistics which I have accumulated show that of all the patients we have seen at the Duluth Clinic since 1915, and where we were able to trace the deaths, just about 50 per cent died of cardiovascular renal disease, with or without cerebral complications. The average age, however, is about sixty years, and a recent medical writer has stated that at forty-five a doctor is at the height of his value to the community and his profession. At least ten years of Frank Wesbrook's life were ground out and destroyed through useless controversy and nonproductive administrative duties that never should have been his. His standing as a scientist is abundantly attested to by the fact that he belonged to the Association of American Physicians, the Association of American Pathologists and Bacteriologists, the London Pathological Society, the Pathological Society of Great Britain and Ireland, the Society of American Bacteriologists, and the American Physiological Society. In 1905 he was elected president of the American Public Health Association. He was honored by the United States Government in making him a member of the advisory board of the hygienic laboratory for the United States Public Health and Marine Hospital Service. Who, I ask you, among our present researchers, is going to equal that record? When it came to the matter of adjudging the University of Minnesota medical school for certification as a Class A school it was Wesbrook who convinced Abraham Flexner of the Rockefeller Foundation that Minnesota had a school with a Class A destiny.

The influence of this great character and personality became apparent early. The intervening years have only attested Wesbrook's great capacity to stimulate others.

Louis B. Wilson, a Saint Paul high school science teacher and a genius in his own right, became Wesbrook's "first-born" in his scientific family. Years after Wilson was absorbed into the great clinic at Rochester, Wesbrook would almost tearfully refer to him as parents now speak of their sons called to war—a great and needed service and a glorious opportunity. To a recent generation who know Wilson chiefly as the genial ogre dispensing the benefactions of the Mayo Foundation, it should be told that a great surgical center was blueprinted by him, to develop into the great scientific, teaching and medical diagnostic center now universally acclaimed. Other men followed in rapid succession—men who have made medical history in Minnesota. Some, like Bob Mullen and Tommy Martin* (my associate), did not long survive Wesbrook—but they had acquired the touch of genius. Harold Robertson came and followed Louis Wilson to Rochester, where he turned the cold and rigid light of necropsy analysis upon the handiwork of the oldest to the most recent recruits in service. Medical history was indeed unfolding. To what beginnings we had made in Duluth, Robertson sent to us George Berdez, and our clinico-pathological conferences at St. Mary's Hospital have carried on uninterruptedly for twenty-two years. Conferences to include roentgenologists and physiologists promise for the future the best method of integrating the activities of all specialists with the main medical

†One of his major legacies to Minnesota was the Piersons. In the field of administration and vital statistics in the secretary's office at the capitol in Saint Paul, they have been invaluable.

*I have made no mention of x-ray in this review. Too much credit cannot be given to roentgenology in this period. I procured the first workable fluoroscopic unit used in Minnesota. Returning from Vienna in late 1912, after seeing the work of Holzknecht and Kreisfuchs, no one could provide me with any similar apparatus. Hearing that Case at Battle Creek, Michigan, had a handmade working unit I visited him. A Chicago firm made a machine for me following Case's instructions. I never became proficient with it, but Martin did. Gastro-intestinal fluoroscopy (so diagnostically essential) is one of the most exacting techniques. Relatively few men are capable of becoming experts in the field. The late R. D. Carman was soon to demonstrate its possibilities at the Mayo Clinic.

current of the period. Men who did not remain long in Wesbrook's laboratories or came in later, as for example, Marx White, the late Arthur Hamilton, Moses Barron, and many others, have been among our best clinicians and teachers.

It is trite to restate that our guild has made more advance in the healing art since the turn of the century than in all preceding time. These accomplishments have multiplied responsibilities and complexities far beyond the permanent prestige they have bestowed. We happen to be living in the most violent social and economic era of all time. All specialists are too prone to attribute our present life extension to their efforts given to the individual sick. We are prone to pass over to bureaus and bureaucrats the management and sustenance of public health activities. Minnesota has been favored beyond the average state in this regard because political maneuvering has not cut into our administrative health activities. We are indebted for this in no small degree to the well-laid plans of both Wesbrook and Bracken and to the distinguished men and women whom they directed into public health work. First credit in this connection must be given to Dr. Orianna McDaniel who, for many years, worked very closely in the laboratories of the State Board of Health with Dr. Wesbrook, and who became his successor. Dr. Albert Chesley grew up, medically speaking, with the department. He worked with the laboratory while a medical student. Later he profited greatly from the pioneering in epidemiology in Minnesota by H. W. Hill.* Chesley thus secured a grasp of administrative health problems that comes to but few in any generation. Fortunately, he had the physique and personality enabling him to acquire the dynamic urge of Bracken, the ingratiating poise of Wesbrook, and the statistical trend (mathematics) of H. W. Hill. Our profession is deeply indebted to him, particularly in these times of political usurpation, when our professional birthright could be so easily exchanged for political pottage. We face the superinvolved issues of the global peace that some time will follow the global war; we need a continuance of the most alert public health programs, because with modern transport methods the spread of diseases and their vectors is only exceeded by the rapidity of the spread of ideologies.

In order that the specialists of the future may profitably service self-sufficient patients, the latter must not die in youth or be maimed later by epidemic encephalitis, poliomyelitis, malaria, or rickettsial infections. Undernourished, impoverished, downtrodden populations are unable to accept and carry out, let alone support, standards of individual medical care to which we have attained. It behooves us, therefore, to recall our indebtedness to the field of public health, and again I must refer to Wesbrook's contacts with it. He was of the generation that produced Adami, Theobald Smith, William H. Welch (Baltimore), Park (New York), and Livingstone Farrand (later President of Cornell University). He was intimate with all of them. They had in common the zeal to spread through the Americas the lifesaving precepts that those after Koch, Loeffler, Pasteur and Von Behring were developing. Wesbrook often spoke of his contact with Klebs and Metchnikoff. After war service in France in 1918, Albert Chesley was sent by the Red Cross into Poland, where typhus and other epidemics were assuming threatening proportions. We may know from this background that it is no accident that our state health administration is qualified to meet any world emergency. It is time to ask ourselves, Are we individually as well qualified? I ask this question with no intention of fashioning an answer. I wish to comment upon the Minnesota medical field as I see it; and especially upon the educational facilities and agencies through which we may hope to retain standards of usefulness entitling us to evade demeaning regimentation.

Maintaining Standards of Medical Education

E. T. Bell, professor of pathology at Minnesota since 1920, and with the department since 1911, has followed in the Wesbrook tradition with a fidelity of purpose and research ability (kidney pathology) that is everywhere admired and acknowledged. He and his staff have packed into their teaching schedules no summation of canned textbook extractions, but vivid daily observations of all that is seen in the ward, developed

*H. W. Hill was Canadian-trained. He remained in Minnesota up to 1912, when he returned to London, Ontario. He returned, however, to Minnesota, a number of times, and once directed the Minnesota Public Health Association. He is living in Minnesota now, but in retirement. He deserves a very high place in recounting our public health accomplishments. In 1906 I accompanied him and saw him in action when we studied typhoid epidemics in Hibbing, Cloquet, and other northern cities. There certainly was much to do to develop proper water supplies and sewage disposal. Neither typhoid vaccination nor water chlorination had yet been developed. Frederic Bass and H. A. Whittaker were still to give us their great services from the mechanical and chemical engineering side. I recall that Hill kept repeating, "Why, we have had more typhoid this year, either in Cloquet or Hibbing, than has the whole state of Massachusetts!" That was the challenge that he met.

at the operating theatres, and found at necropsy. We shall continue to have the right kind of doctors if they have his type of basic training. The student entering his classes in his final two years encounters no new vocabulary or confusing technique. Clinical concepts are naturally implemented into the basic pathological instruction. When the student becomes an intern, and later in any type of staff organization, he is able to hold continued contacts and counsel with the clinical and tissue pathologists. I mention this obvious situation (now obtaining in all Class A medical schools) not only to give credit where it is due but to point out that this fortunate sequence does not obtain in the field of physiology and its allied sciences.

Medical Journals and Publications

The world-wide exchange of medical ideas arises from our splendid and varied current literature. Keeping up with it even in a limited field has left so appalling a task that it must be made to yield satisfactory recompense. Endless and fatiguing reading is not the answer. Some men have an uncanny capacity for collecting from the medical literature the very items they are able to use in their current practice and apply in cataloguing their daily erperiences. Let me illustrate in terms of some of my Duluth associates. In 1927 Lloyd Merriman* was called to the western part of the state to see the mother of a dentist confrere. She had a curious typhoid-like illness that had been very puzzling. By recalling a short note that he had seen in the *Journal of the American Medical Association* he was led to make inquiry concerning the skinning of some rabbits which had preceded her illness. He was able to prove, through specimens sent to the U. S. Public Health laboratories in Washington, that the disease was tularemia. He has been given, therefore, great credit for this "first" in Minnesota. Within a few weeks a fox farm operator on the North Shore came into St. Mary's Hospital; he lived only a few days. An intern, imbued with the remark he had heard about Dr. Merriman's experience, awoke to the situation of the man's scarred finger and axillary adenitis just in time to send a blood specimen to the late Dr. Edward A. Francis. An autopsy was steadfastly refused until the term "rabbit disease" was suggested, and then everyone, including the undertaker, was most zealous for an examination. Drs. Richard Bardon and George Berdez† were able to report and send a specimen to Dr. Francis of this first autopsied human case of tularemia with a caseating pneumonic process in the United States.

As a result of his wide reading and extraordinary memory, Dr. Frank J. Hirschboeck has an imposing series of "firsts." His was the first report received for publication in the United States on massive atelectasis of the lungs. A man developed bilateral atelectasis after an abdominal operation. These are Hirschboeck's own words: "I remembered having read an article by Tingley and Elliott in the London *Lancet,* published in 1911, in which they reported eleven cases of massive atelectasis following surgery . . ." Scrimger of Montreal, Canada, had reported the condition in February, 1922. Hirschboeck's* report came out in early August, 1922. Hirschboeck made the first report in Minnesota to the State Board of Health on a case of lethargic encephalitis occurring at Carson Lake, Minnesota. In making this report he referred Dr. Green, epidemiologist for the State Board of Health, to an editorial he had read explaining the disease. He made this report in March, 1919. He correctly diagnosed another case one month later, after listening to the symptoms as related by the late Dr. A. J. Braden. It requires an agile memory to bring to mind something you have read six years previously. Schultze, in Germany, reported an instance of agranulocytosis in 1922. Hirschboeck recalled this and correctly applied the diagnosis to a patient of Dr. W. G. Strobel, whose death occurred on February 4, 1928. Hirschboeck later reported this case to the Minnesota Society of Internal Medicine, but he did not publish it. He has others which appear equally uncanny, but I recite these evidences less to remark the genius that he is than to point to a masterful way of utilizing medical texts and articles. Next to the credit that comes from first describing a disease or syndrome should come that for recognizing it from the description and interpreting it to one's fellows. MINNESOTA MEDICINE has been the outlet for much of that type of reporting. It performs for our district as does the *New England Medical Journal* for the region medical-

*Merriman, Lloyd L.: Tularaemia; a comparative study of four cases originating in Minnesota. Minn. Med., 10:719, (Dec.) 1927.

†Bardon, Richard, and Berdez, George: Tularemia: Report of a fatal case, with postmortem observations. Jour. A.M.A., 20:1369, (Apr. 28) 1928.

*Hirschboeck, F. J.: Postoperative massive collapse of lungs. Am. Jour. Med. Sci., 164: 268, (Aug.) 1922.

ly tributary to Boston. This type of journal as well as the so-called "pure research" journal, each has its place. The results of "pure research" often attain applicable clinical interpretation only after it has been transposed by working clinicians into the papers that make up the programs of our numerous medical societies.

Special Medical Societies

Complaints have come on occasion from our county, state and American Medical Association administrative officers that a surfeit of special societies has withdrawn program support from them. The implication is that those offering original material prefer to give it to societies of specialists and to specialist journals. There is no need for alarm. It works the other way. Men certified for special societies attain to that position by their efforts at limitation of their field and perfecting themselves within it. Certification by boards is only a formal way of standardizing and adjudging candidates and the reports made of their work. The regret is that general program builders find it difficult to induce general practitioners to pledge themselves to give papers; and it is true that "headliners" are sought out to attract attendance at meetings. The result is that all therapeutic advances soon get to the general practitioner and he uses them well to the extent of his diagnostic ability.

Leonard Rowntree while in Minnesota was one of the prime movers for starting and developing the Minnesota Society of Internal Medicine. The membership of sixty has provided a place for representative internists from the Twin Cities, Rochester and Duluth. The aim is to include more men from the smaller cities as they are certified. The Mayo Clinic and the University faculty members have given great impetus to this society. I hold it (with its two meetings yearly) to be the most helpful and stimulating of the many to which I belong. The meetings are open to invited guests from adjacent states. The consolidated programs, with ten-minute papers and five minutes more for discussions, rivet the audience's attention and develop lucid expression. All praise to the specialist societies. Next to the current literature they inhibit "lag" in the "March of Medicine."

The American Colleges and Graduate Education

The College of Physicians had one of the best of its annual sessions in Saint Paul in May, 1942. Bringing the meeting to Minnesota (a signal honor) was largely the accomplishment of Dr. John Lepak of Saint Paul. The college plans to meet the demand for some method for special training of internists seeking either certification or refresher courses. Cecil Watson at the university and Edgar Allen at Rochester planned two-weeks courses to groups of sixty men each just prior to the Saint Paul session. The courses were most enthusiastically received and praised. Such graduate courses have been given preceding the annual college convocations for five years. The war is likely to interrupt them, but regional meetings should be planned not only for the men at home but those in the armed forces as well.

This educational program is the most profitable goal of the American College of Physicians. There are all too few places available for graduate fellowships in medicine. Minnesota is preeminent because of the Mayo Foundation and our university. The future must develop more such facilities; and with the multiplication of government and military hospitals some coördinated plans should be easily worked out. Hospitals designed for various military exigencies (orthopedic, psychopathic, facial and dental reconstruction) are already on the way. It is time to deviate widely from the basic ideas of physical reconstruction and attack the more common and complex problems of functional imbalance.

Physiology, Pharmacology, Anesthesiology

These fundamental sciences provide the same avenue of approach to homeostatic imbalance that pathology and bacteriology have given us for so-called "organic disease." Whether in peace or wartime we need more neuropsychiatrists and fewer surgeons is a question. I have traced how internal medicine has profited superbly by additions to the field of men trained in bacteriology and pathology. More men should come into the field similarly trained in physiology and its allied sciences. Carlson, Cannon, Ivy and Wiggers have been showing the way for two decades. Mann and his coworkers at Rochester have given the impetus to scores of the Mayo clinicians (all branches): liver disease (Snell and Butt); vascular disease (Brown, Allen, Willius, Horton)—

all leading toward physiological and pharmacological exploitation. One of the meatiest books ever written on the heart was by the late Arthur Hirschfelder* of our department of pharmacology. Yet after he came to Minnesota from Johns Hopkins he lost all contact with clinical teaching. I am not imputing blame or criticism. I am simply stating a fact: few interns from any medical school in the past twenty-five years have ever admitted (to my pointed question) that the intellectual inoculations they got in the sciences, allied to and including physiology, ever worked longer than to confer temporary immunity to the blight of the final examinations. This is outrageously wrong. A few men have seen the light. Henry Ulrich received a permanent inoculation at Johns Hopkins. Among his many contributions has been his molding of the Minnesota Heart Society, and insistence upon the cultivation of physiological understanding. Hilding Berglund,† when professor of medicine, brought the greatest gathering of distinguished medical scientists ever to assemble in Minnesota. It was for the purpose of an organized symposium on kidney disease. Recall the distinguished names from home and abroad: Richards from Pennsylvania, Volhard from Frankfort-on-Main, Isidore Snapper from Amsterdam, and many others. Physiology and pharmacology were co-equal with pathology in the review of research and clinical application. George Fahr, with his students, has brought the spirit of clinical physiological approach to his routine and research at the Minneapolis General Hospital. John Lundy has made history in a greatly expanded field of anesthesiology at the Mayo Clinic. What he is doing largely for surgical patients must be expanded to cover many technical phases of pain relief in general and the methods to keep the body constants stabilized.

The Center for Continuation Study

Medical schools do little more than plant the seed that replenishes the guild personnel. Thereafter there remains much to be done in the period of cultivation. Not all fields and soils are alike. Different purposes and products are best served by judicious individual selections. It is so with doctors. It will be a sad day when regimentation makes doctors all alike, even as post-office clerks.

The continuation service center at the university meets the needs of our calling in a manner made very obvious by the extent to which its exquisite accommodations have been used for medical sessions. It is not easy for some of us to clearly dissociate the building from our medical mentor, William A. O'Brien. His tact and enthusiasm have been invaluable. His radio work on behalf of the public is a popular presentation, enlightening, informative, and just enough of medical appeal so that it misses evangelistic exhortation. He knows doctors as do few men—their needs, idiosyncrasies, "pet peeves," and what they like. This has given him much insight into medical staff and program organization. The Staff Meeting Bulletins, under the technical assembling of Gertrude Gunn, reflect all this. It was in the "Gossip Column" in one of the 1942 issues that I first learned that the specialty of internal medicine was in first place in Minnesota. It was further noted that medical visitors to the University Hospitals commented upon this and congratulated Professor Wangensteen upon his development of physiological principles in surgery.

Let us aim to make physiology, pharmacology and anesthesiology a working division right in the midst of our clinic problems. It is incumbent upon us to have modern anesthetists in our hospitals without delay. Perhaps in war service some preliminary training may be given to men qualified for this service. But over and beyond any immediate emergency utilization, as for shock, burns, blood bank service, et cetera, looms the much bigger problem of the psychoneurotics and the insane. The next quarter-century should plan to do something for them through studies of their physiological imbalance. It does not seem especially hopeful simply to house the insane. Functionally disordered folk (anxiety neuroses) are found for the most part among our most civilized people. Let us study civilization.

---

*In London in 1912 Sir Thomas Lewis asked me about Hirschfelder's clinical services and remarked that they must have been extensive because of his book. Hirschfelder, Arthur Douglas: Diseases of the Heart and Aorta. J. B. Lippincott Co. Three editions, 1910, 1913, 1918, respectively.

†These lectures were later edited and arranged by Berglund, Medes, Huber, Longcope and Richards. Lea & Febiger, 1935.

Addenda.—The *Journal of the American Medical Association* (Dec. 5, 1942) saw fit to RADIO from Moscow Lepukaln's report upon the War Surgery in Russia of "Academician Burdenko." The reader will note at once the *physiological* basis of the Russian research and how fully it guides their newer surgery.

CORONARY DISEASE

Certain Significant Contributions Made During the Last Quarter Century

FREDRICK A. WILLIUS, M.D.
Rochester, Minnesota

IT IS fitting that this commemorative issue of MINNESOTA MEDICINE, marking the completion of twenty-five years of constructive editorial effort, should contain certain reflections on the medical progress made during its existence. While the medical sciences have made almost unbelievable progress, civilization as a whole has been regressive, as indicated by the fact that at the time of the issues of Volume 1, Number 1 of MINNESOTA MEDICINE most of the world was at war and again, with the appearance of Volume 26, Number 1, virtually all the nations of the world are gripped in mortal conflict. It is lamentable that the advances in medicine, designed to prevent and control disease, to ameliorate suffering and to prolong life, could be devastated by the ruthless slaughter of countless human beings by demonic forces of destruction. This paradox is a challenge and demands the greatest effort of the medical profession, now and after victory comes, to make a repetition of this catastrophe impossible.

The advances in cardiology have been so great and numerous during the last quarter century that it seems desirable to limit this review to a single phase of the subject. So outstanding have been the contributions dealing with coronary disease that an entirely new philosophy has been evolved, not only concerning itself with the coronary circulation, but integrating itself inseparably into the entire subject of cardiovascular diseases. Even in this one phase of cardiology it is impossible to acknowledge the efforts and contributions of all the workers who have made progress a reality.

Anatomy of the Coronary Circulation

In 1918, F. M. Smith,[60] studied the coronary arteries of man and the dog by injection methods and roentgenologic depiction of the circulation. His studies indicated a close similarity in distribution of the main vessels in both man and the dog and he concluded that on this basis the dog's heart was suitable for experimental purposes. He also demonstrated small anastomotic branches between the arteries of the right and left ventricles.

Three years later (1921), Gross published his important monograph dealing with the blood supply to the heart. This very comprehensive work comprised a study of many specimens of the human heart, both normal and pathologic. Injection of opaque media and subsequent roentgenography afforded remarkable opportunity for comparative observations. Unusually small vessels were clearly visualized and anastomotic vessels were readily demonstrated. The distribution and ramifications of the arterial tree were studied and the distribution of the circulation in the various periods of life was compared. Gross concluded that a relative regression of the arteries of the right side of the heart occurred as age advanced. This contention, however, has been disproved by subsequent studies. Gross' work was outstanding and opened the way for subsequent studies, all of which have been contributory to a clearer understanding of the coronary circulation.

In 1924, Oberhelman and LeCount called attention to a most important observation regarding the coronary arteries. They emphasized the great variations which occur in the distribution and ramification of the vessels in individual cases. Their observations have been repeatedly verified by subsequent investigations.

Wearn,[65,66] four years later, called attention to the extensiveness of the capillary circulation of the heart and discussed the role of thebesian circulation under normal and diseased conditions.

Whitten's studies[71-73] (1928, 1930) of the coronary arteries were outstanding. Using the injection-corrosion method with a differential color scheme for the arteries of the right and the left sides of the heart and the veins, he demonstrated certain fundamental facts. One of the important observations was that in most hearts the posterior basal surface of the left ventricle is supplied by branches of the right coronary artery and that when sudden closure of the right coronary artery occurs the resulting infarct is not situated in the right ventricle but involves the

From the Section on Cardiology, The Mayo Clinic, Rochester, Minnesota.

posterior basal surface of the left ventricle. He also demonstrated the differences in the general architecture of the right and the left coronary arteries. The right coronary artery is smaller and more superficial and has gradual ramifications while the left coronary artery is larger and has deep penetrating branches issuing at right angles to the main artery. He also showed that the right coronary artery as soon as it contributed to the supply of the left ventricle lost its architectural characteristics and assumed those of the left coronary artery.

Physiology of the Coronary Circulation

During this span of years, investigators have carried out exhaustive studies dealing with physiology of the coronary circulation. Outstanding among these contributions have been the careful researches of Anrep and his co-workers[1-7] which are so comprehensive that only generalities can be discussed. Experiments were conducted both with the denervated heart-lung preparation and the innervated mammalian heart. Their work clearly showed that in the denervated heart-lung preparation arterial blood pressure was the chief factor influencing coronary blood flow. In this type of experiment no significant change in coronary blood flow occurred during phases of cardiac acceleration. These workers employed the hot wire method and, after slowing the heart by cooling, stimulated the ventricle to contraction by single induction shocks. They concluded that the effect of cardiac acceleration on the coronary blood flow depended on the combined effects of the change of duration and the strength of the resulting premature contraction.

Anrep and his co-workers further demonstrated that the compressing effect of the contracting heart muscle was capable of diminishing coronary blood flow. Increases in coronary blood flow occurring with increased cardiac output in the innervated heart were shown to be of reflex origin for this effect was abolished after section of the vagi. The action of a wide range of drugs on the coronary circulation also was investigated. It was shown that drugs capable of elevating arterial blood pressure also were capable of decreasing coronary blood flow during systole and of increasing it during diastole. Extracts of the pituitary body greatly reduced the coronary blood flow. In progressive spontaneous myocardial failure it was shown that the discharge of blood from the coronary sinus was diminished as much as 30 per cent.

Notable studies have also been contributed by Essex and his co-workers.[22-27,36,38,68] Their various studies have been conducted by means of a thermostromuhr according to the method of Essex, Herrick, Baldes and Mann.[8,25] Using the heart-lung preparation, their conclusions agreed with those of other workers that the coronary blood flow depended greatly on the mean arterial pressure. No effect on coronary blood flow was observed with changes in cardiac output provided the arterial pressure and the temperature of the perfusing medium were maintained at constant levels. Coronary blood flow was increased on an average of about 150 per cent when the cardiac branches of the stellate ganglion were stimulated and this effect was believed in part to result from a vasodilator action of the sympathetic nerves. Contrary to Anrep's belief, Essex and his co-workers were able to demonstrate an increase in coronary blood flow with acceleration of heart rate which was clearly not the result of elevation of the mean arterial blood pressure.

A very interesting group of experiments was conducted on trained dogs with the thermostromuhr in place. Thus, the influence of exercise on the coronary blood flow was investigated. These workers demonstrated that successive increases in the rate of work produced additional rises in blood pressure which were approximately proportional to the rate of work for the individual animals in both the control and the experimental groups. In some instances the blood pressure reached its peak early and declined. In some cases it remained near the peak, while in others it continued to rise throughout the entire period of exercise. The great variations which occurred in coronary blood flow could not be satisfactorily explained by changes in blood pressure alone and these investigators concluded that changes in pulse rate with exercise were usually a better criterion of changes in coronary blood flow than were the changes in arterial blood pressure.

In another series of experiments under the same conditions these investigators studied the influence of various drugs on the coronary blood flow. They concluded that changes in the blood flow in the right and left coronary arteries of the trained dog responded in the same qualitative manner to the drugs administered. Drugs known to lower arterial blood pressure, such as theo-

phylline ethylenediamine (aminophylline), histamine, muscle adenosine phosphoric acid (M. A. P.), acetyl-beta-methylcholine chloride (mecholyl), glyceryl trinitrate and papaverine, when administered in proper doses, caused a marked increase in the coronary blood flow, as much as 200 to 300 per cent in certain instances. With only two exceptions, the action of these drugs, when given intravenously, was of short duration. Anesthesia with pentobarbital sodium (nembutal) in one instance resulted in a prolonged augmentation of coronary blood flow.

Drugs which customarily raise arterial blood pressure, such as pitressin, decreased the coronary blood flow as much as 80 per cent and reduced the heart rate. Atropine increased the coronary blood flow as much as 86 per cent and accelerated the cardiac rate, but had little effect on the arterial blood pressure.

Essex, in collaboration with Herrick and Visscher, investigated the action of certain glucosides of digitalis lanata on the coronary blood flow and blood pressure in the trained dog. The glucosides were injected in doses smaller than those capable of producing retching and vomiting. The mean blood flow in the circumflex branch of the coronary artery was measured. In thirteen experiments, with the doses employed, the digilanids A, B, and C, and no effect on the mean coronary blood flow.

Visscher and his associates in their experimental studies reëmphasized the importance of pressure gradients in the control of coronary blood flow. They showed that the greater the differences in pressure between the aorta and the pulmonary artery, the greater is the thebesian flow, while the coronary sinus flow is reduced. When the aorta-pulmonary artery pressure head is less than 60 mm. of mercury, the thebesian flow subsides greatly. The higher the aorta-coronary sinus pressure difference, the greater will be the coronary sinus flow.

Katz and his co-workers studied the distribution of the coronary blood flow and made important observations regarding the drainage mechanism of the venous blood. They showed that an average of 92 per cent of the blood from the right circumflex artery drains into the right thebesian system, while the coronary sinus receives an average of only 1 per cent and the left thebesian system an average of 7 per cent of the blood. In the case of the left circumflex artery, the right thebesian system drains an average of 48 per cent of the blood, the coronary sinus, an average of 38 per cent, and the left thebesian system, 14 per cent of the blood. The anterior descending branch of the left coronary artery drains an average of 51 per cent of its blood into the right thebesian system, an average of 42 per cent by way of the coronary sinus, and an average of 7 per cent into the left thebesian system. These studies clearly showed the importance of the right thebesian system as a drainage bed, even of the blood from the arteries of the left side of the heart. Thus, approximately as much as two-thirds of the total blood flowing through these three important arteries drains into the right thebesian system and less than a third into the coronary sinus.

Other important contributions include those of Wiggers,[74,75] Fowler, Hurevitz and Smith, Gunn, Gruber and Kountz, and others too numerous to mention.

Pathology of Coronary Disease

Numerous notable contributions dealing with the pathology of coronary disease have appeared in the medical literature of the last quarter century. Outstanding among these studies have been those dealing with both sudden and gradual closure of coronary arteries. The pathologist as well as the clinician has developed an entirely new philosophy regarding the myocardial response to coronary occlusion. In 1918, only six years after Herrick's monumental article, "Clinical Features of Sudden Obstruction of the Coronary Arteries," the medical profession gradually developed a clinical consciousness of this condition, and the occasional diagnosis of that era has been transformed into the routine diagnosis of today.

Considerable interest has been evidenced and numerous investigations have been undertaken dealing with the causes of coronary atherosclerosis. The work of Leary has been especially interesting. This investigator in 1934, after detailed microscopic study in a reasonably large series of cases of coronary atherosclerosis, suggested that the changes could no longer be considered as results of an aging process but, rather, that they represent a disturbance in the lipoid metabolism of the body, and that atherosclerosis belongs to the class of metabolic diseases, such as diabetes mellitus, obesity and gout. Although Leary's hypothesis has not been definitely proved, it has given the profession ample food for thought and

has opened the way for other investigations in this field. The plasma lipoid studies of Barker on obliterative atherosclerotic disease of the extremities and my studies[80,81] on coronary disease have shown the existence of hyperlipemia in many cases. Montgomery and Osterberg called attention to the frequent coexistence of xanthomatosis with hyperlipemia and coronary disease.

White and Patmos, of the Mayo Foundation, conducted a careful histopathologic study of the healing of cardiac infarction. This investigation was of extreme clinical importance because it offered a measurement that enabled the clinician to determine more accurately the length of time required for complete rest of the patients in bed. Infarcts which had been present for from a few hours to several years were studied. This work, unfortunately was never published, but I have repeatedly referred to it in the literature and have accorded full credit to these workers.

They found that when death occurred within two to four hours after coronary occlusion, regions of focal degeneration were present in muscle bundles of apparently normal appearance. In the muscle bundles, however, regions of early necrosis, cloudiness, pyknosis of nuclei and diminution of the transverse striations were demonstrable and there were slight interstitial edema and congestion of the blood vessels. Infarcts of from four hours to five days old exhibited complete necrosis and acute inflammation. The necrotic regions were found to coalesce, and numerous polymorphonuclear leukocytes were seen around the edges. A few lymphocytes, mononuclear leukocytes and extravasated erythrocytes were visible. In infarcts which were two days old, phagocytosis was well under way.

The amount of fat in the necrotic and degenerated muscle cells was found to be increased and karyorrhexis and karyolysis of muscle bundles were marked. Cellular changes, ranging from hyaline to granular degeneration, occurred. Fibroblasts were observed occasionally at the margins of the necrotic portions of the infarcts which were thirty-six hours old, but they were not plentiful except in infarcts five days old. Infarcts from five to twenty-two days old and even older gave evidence of rapid disappearance of the inflammatory reaction and gradual replacement by connective tissue. After twenty-two days, regions of diffuse fibrosis were present. In infarcts which were from four to six months old, condensation and contraction of the fibrous scar were present, representing complete healing.

In a later publication, similar conclusions were reached by Mallory, White and Salcedo-Salgar.

In 1932, Bartels and Smith demonstrated the occurrence of gross cardiac hypertrophy in the presence of healed myocardial infarction, particularly when multiple infarcts had occurred. Subsequent clinical and pathologic correlations have irrefutably supported this contention in spite of the opposition of certain pathologists who persist in their conviction that such hearts have been subjected to the influences of hypertension in spite of completely contradictory evidence.

The same year interest became focused not only on the presence of cardiac infarction but also on the localization of the infarct. Barnes and Ball reported their findings of the incidence and situation of myocardial infarcts in 1,000 consecutive postmortem examinations.

The studies of Blumgart, Schlesinger[15-17] and their associates dealing with collateral circulation have been outstanding and the importance of the method of repair has been well emphasized. They showed that anastomotic communications of less than 40 microns in diameter between various coronary arteries exist in the normal heart, but apparently play only a potential role in the prevention of the sudden and perhaps serious effects of coronary narrowing or occlusion. When marked narrowing or occlusion of coronary arterial tributaries takes place, collateral circulation tends to occur and intercommunicating vessels of up to 200 microns in diameter may be found. Such collateral circulation is capable of compensating for the reduced vascularity resulting from atherosclerotic narrowing or actual occlusion of main coronary arteries, so that the blood supply of the heart remains relatively adequate for a restricted manner of life. Death occurs whenever a sufficiently large portion of the myocardium undergoes ischemia, with or without necrosis, or when other fatal circumstances intervene, such as profound disturbances in rhythm (asystole or ventricular fibrillation) or congestive heart failure. The serious consequences of coronary insufficiency occur when imbalance exists between the nutritional requirements of heart muscle and the factors which permit adequate nutrition to occur.

Paterson and also Nelson have emphasized the role of intimal hemorrhage in producing coron-

ary thrombosis. Hemorrhage from sinusoidal blood vessels which are found near atheromatous plaques is not uncommon. Hemorrhagic lesions of the coronary arteries have recently been studied and reported by English and me.

Diagnosis of Coronary Disease

The era of twenty-five years ago found the medical profession confused regarding the recognition and identification of diseases of the myocardium. A short time previously, the teaching of cardiology had been centered on cardiac murmurs and the minutia of auscultatory findings had obscured the greater issue of clinicopathologic correlations. The universal employment of the term "chronic myocarditis" seemed self-sufficient and countless diagnoses were tossed into this rather meaningless category. Gradually it became evident that specific types of cardiac disease belonged in specific categories and thus physicians found an ever-decreasing incidence of so-called chronic myocarditis and an ever-increasing incidence of coronary disease, hypertensive heart disease and the co-existence of both.

As already stated, Herrick's article on sudden coronary obstruction kindled medical consciousness to this important condition which for many reasons has been destined to become the formidable problem that it is today. Up to this time the diagnosis of angina pectoris included many instances of coronary obstruction. Gradually, the medical literature became charged with an ever-increasing number of splendid articles calling attention to the typical as well as the atypical clinical manifestations of the condition and separating the phenomena from those of the anginal syndrome of coronary atherosclerosis. Among these articles were those of Christian, White and his associates,[28] Gibson, Hamman, and many others.[19,35,40,41,43-48,50,51,62,64,67,84]

Electrocardiography in Coronary Disease

Notable advances have been made in the science of electrocardiography during the last twenty-five years particularly with regard to the correlation of electrocardiographic abnormalities with clinical and postmortem findings.

Although some of the pioneer studies of electrocardiography in coronary disease require modification in view of present-day knowledge, nevertheless they marked significant advances in the evolution of this field. Among them were the studies of F. M. Smith[59] and Willius.[76,77]

In 1920 Pardee[55] accurately described the cove type of T wave change in acute obstruction of the coronary artery and this report did much to stimulate other investigators to amplify the understanding of other changes in the graphic configuration. Parkinson and Bedford's splendid study appeared in 1928 and paved the way for subsequent investigations dealing with the electrocardiographic criteria for the localization of infarcts. These authors showed that the changes in the RS-T segments could be placed in two groups, the T_1 and the T_3.

A year later, Barnes and Whitten demonstrated that it was possible to localize the region of infarction in the left ventricle when certain electrocardiographic alterations were recorded. The T_1 type of electrocardiogram indicated infarction of the anterior surface of the left ventricle, whereas the T_3 type indicated infarction of the posterior basal portion of the left ventricle.

Wilson and his co-workers and Barnes[10,11] also showed the significance of certain changes in the initial deflections of the ventricular complexes in relation to acute myocardial infarction. The Q_1 pattern was found to be associated with acute or healing acute infarction in the anterior and apical portion of the left ventricle and the adjacent interventricular septum while the Q_3 pattern was found to occur with acute or healing acute infarctions in the posterior basal portion of the left ventricle and adjacent interventricular septum.

In 1934,[78] I published the electrocardiographic findings in 2,000 cases of coronary sclerosis with the anginal syndrome. Normal records were obtained in 34 per cent of the cases while the remaining patients displayed one or more significant abnormalities such as T wave negativity, conduction defects, auricular fibrillation and flutter and lengthened Q wave in lead III. The total group comprised patients with and without hypertension and healed cardiac infarction.

This era also witnessed the introduction of multiple thoracic leads. In 1932 Wolferth and Wood [83,84] placed electrodes directly on the anterior and posterior surfaces of the thorax and by their manner of placement recorded the fourth lead directionally opposite to the conventional first lead. This method was quite universally employed until attempts at standardization were made by the Committee[61] for the Standardization of Precordial Leads of the American Heart Association. Differences in the resultant electrocar-

diograms occur when slight differences in the placement of the electrode occur so that the method is fraught with dangers by those not fully aware of the possible technical variations. This phase of the science of electrocardiography can only be mentioned here as a distinct forward step —detailing it would be a study unto itself.

A word of warning here may not be inappropriate. While the science of electrocardiography has made remarkable progress in the last quarter century its more extended use by the medical profession has permitted the development of certain evils. Electrocardiography, like other diagnostic methods, is basically a clinical adjunct and must remain in this order of importance to ensure its perpetuity. Physicians superficially trained in electrocardiography have the inclination to infer clinical diagnoses from the electrocardiogram alone, a procedure which can never be tolerated. They look upon the graphic registration as an all-revealing method which permits them to simplify their diagnostic scheme by according the same interpretation and significance to certain minutia regardless of the cause of the cardiopathy, the state of function of the heart, the physical findings, and so forth. Such destructive influences must be removed in order to preserve the gains which have been accumulated.

Prognosis in Coronary Disease

With the passage of the years and the accumulation of medical experience based on a remarkably improved diagnostic philosophy, the profession has greatly altered its concept regarding the prognosis of coronary disease. This is particularly true regarding sudden obstruction of a coronary artery with acute infarction of the myocardium. Twenty-five years ago it was quite generally believed that the majority of the patients succumbed immediately or soon after the attack.

Gradually studies appeared and indicated that not all patients with coronary thrombosis were destined to die but that many recoveries ensued and even some patients recovered sufficiently to participate actively in life. Among these studies were those of White,[70] Pardee,[56] Ernstene, Levy,[46] Willius and others.[79]

Treatment of Coronary Disease

While countless suggestions have been forthcoming regarding the treatment of coronary disease this chapter still woefully falls short of its mark. Nevertheless, the better understanding of coronary disease in general has permitted the profession to accomplish much in the application of nonspecific measures. I refer particularly to the fuller realization of the necessity and importance of instituting individualized regimens which can be very comprehensive in scope and when adhered to may remarkably safeguard and prolong the life of the individual patient. Therapeutic suggestions, both medicinal and surgical, have been so numerous that space forbids their detailed discussion or bibliographic reference so that only some of them will be mentioned.

The beginning of this last quarter century still witnessed the employment of cervical sympathectomy and its various modifications as well as paravertebral injection of procaine hydrochloride and absolute alcohol. These procedures have gradually but hopefully lost their appeal. Then came the xanthine drugs (vasodilators) such as theobromine, theophyllin, theosin, theobromine-sodio-salicylate, aminophylline, and so forth. These drugs, while apparently beneficial in a certain percentage of cases, fall far short of a therapeutic success. This was followed by the startling advocation of total thyroidectomy for the control of coronary disease and congestive heart failure from other causes. The procedure was based on the premise that the resulting drop in the basal metabolic processes of the body would result in reduced cardiac demands and work. Its proponents soon lost their enthusiasm and the method has now been generally abandoned.

Various operations were then advocated attempting to bring about new circulation to the heart by the transplantation of muscle flaps, omentum, and so forth. More recently, the introduction of talc into the pericardium with the intention of causing adhesions between the visceral and parietal pericardium and thereby increasing the circulation of the heart has been advocated. These procedures, while interesting and ingenious, are obviously still in their experimental phase and must be received with caution.

Other suggestions comprise the intramuscular injection of a tissue extract, radiation of the suprarenal glands and inhalation of trichlorethylene.

References

1. Anrep, G. V.: The regulation of the coronary circulation. Physiol. Rev. 6:596-629, (Oct.) 1926.
2. Anrep, G. V.: Lane medical lectures; studies in cardiovascular regulation. 118 pp. Stanford University, California; Stanford University Press, 1936.
3. Anrep, G. V., and Bulatao, E.: Observations on the pulmonary circulation. Pulmonary circulation in the heart-lung preparation. Jour. Physiol., 60:175-192, (July) 1925.

4. Anrep, G. V., and Häusler, H.: The coronary circulation. I. The effect of changes of the blood-pressure and of the output of the heart. Jour. Physiol., 65:357-373, (Aug.) 1928.
5. Anrep, G. V., and Segall, H. N.: The regulation of the coronary circulation. Heart, 13:239-260, (Sept.) 1926.
6. Anrep, G. V., and Stacey, R. S.: Comparative effect of various drugs upon the coronary circulation. Jour. Physiol., 64:187-192, (Nov.) 1927.
7. Anrep, G. V., Blalock, A., and Hammouda, M.: The distribution of the blood in the coronary blood vessels. Jour. Physiol., 67:87-96, (Feb.) 1929.
8. Baldes, E. J., and Herrick, J. F.: A thermostromuhr with direct current heater. Proc. Soc. Exper. Biol. and Med., 37:432-435, (Dec.) 1937.
9. Barker, N. W.: The plasma lipoids in arteriosclerosis obliterans. Ann. Int. Med., 13:685-692, (Oct.) 1939.
10. Barnes, A. R.: Correlation of initial deflections of ventricular complex with situation of acute myocardial infarction. Am. Heart Jour., 9:728-733, (Aug.) 1934.
11. Barnes, A. R.: Electrocardiographic patterns; their diagnostic and clinical significance. 197 pp. Springfield, Illinois: C. C. Thomas, 1940.
12. Barnes, A. R., and Ball, R. G.: The incidence and situation of myocardial infarction in one thousand consecutive postmortem examinations. Am. Jour. Med. Sci., 183:215-225, (Feb.) 1932.
13. Barnes, A. R., and Whitten, M. B.: Study of the R-T interval in myocardial infarction. Am. Heart Jour., 5:142-171, (Dec.) 1929.
14. Bartels, E. C., and Smith, H. L.: Gross cardiac hypertrophy in myocardial infarction. Am. Jour. Med. Sci., 184: 452-455, (Oct.) 1932.
15. Blumgart, H. L., Schlesinger, M. J., and Davis, David: Studies on the relation of the clinical manifestations of angina pectoris, coronary thrombosis, and myocardial infarction to the pathologic findings; with particular reference to the significance of the collateral circulation. Am. Heart Jour., 19:1-91, (Jan.) 1940.
16. Blumgart, H. L., Schlesinger, M. J., and Zoll, P. M.: Angina pectoris, coronary failure and acute myocardial infarction; the role of coronary occlusions and collateral circulation. Jour. A.M.A., 116:91-97, (Jan. 11) 1941.
17. Blumgart, H. L., Schlesinger, M. J., and Zoll, P. M.: Multiple fresh coronary occlusions in patients with antecedent shock. Arch. Int. Med., 68:181-198, (Aug.) 1941.
18. Christian, H. A.: Cardiac infarction (coronary thrombosis); an easily diagnosable condition. Am. Heart Jour., 1:129-137, (Dec.) 1925.
19. East, C. F. T., Bain, C. W. C., and Cary, F. L.: Cardiac infarction without pain; a series of eight cases. Lancet, 2:60-63, (July 14) 1928.
20. English, J. P., and Willius, F. A.: Unpublished data.
21. Ernstene, A. C.: Observations on coronary thrombosis: with a report of three recovered cases. Am. Jour. Med. Sci., 178:383-390, (Sept.) 1929.
22. Essex, H. E.: The coronary blood flow of the trained dog. Pub. No. 13, Am. Assn. Advancement Sci., pp. 73-80, 1940.
23. Essex, H. E., Herrick, J. F., and Visscher, M. B.: Influence of certain glucosides of digitalis lanata on the coronary bood flow and blood pressure in the trained dog. Am. Heart Jour., 16:143-148, (Aug.) 1938.
24. Essex, H. E., Herrick, J. F., Baldes, E. J., and Mann, F. C.: Blood flow in the circumflex branch of the left coronary artery of the intact dog. Am. Jour. Physiol., 117: 271-279, (Oct.) 1936.
25. Essex, H. E., Herrick, J. F., Baldes, E. J., and Mann, F. C.: Digitalis and coronary blood flow. Proc. Soc. Exper. Biol. and Med., 38:325-328, (Apr.) 1938.
26. Essex, H. E., Herrick, J. F., Baldes, E. J., and Mann, F. C.: Influence of exercise on blood pressure, pulse rate and coronary blood flow of the dog. Am. Jour. Physiol., 125:614-623, (Mar.) 1939.
27. Essex, H. E., Wegria, R. G. E., Herrick, J. F., and Mann, F. C.: The effect of certain drugs on the coronary blood flow of the trained dog. Am. Heart Jour., 19:554-565, (May) 1940.
28. Faulkner, J. M., Marble, H. C., and White, P. D.: The differential diagnosis of coronary occlusion and of cholelithiasis. Jour. A.M.A., 83:2080-2082, (Dec. 27) 1924.
29. Fowler, W. M., Hurevitz, H. M., and Smith, F. M.: Effect of theophylline ethylene-diamine on experimentally induced cardiac infarction in the dog. Arch. Int. Med., 56: 1242-1249, (Dec.) 1935.
30. Gibson, A. G.: The clinical aspects of ischæmic necrosis of the heart muscle. Lancet, 2:1270-1275, (Dec. 19) 1925.
31. Gross, Louis: The blood supply to the heart in its anatomical and clinical aspects. New York: Paul B. Hoeber, 171 pp, 1921.
32. Gruber, C. M., and Kountz, W. B.: Some observations on the effect of pitressin upon the cardiovascular system. Jour. Pharmacol. and Exper. Therap., 39:435-447, (Aug.) 1930.
33. Gunn, J. A.: The action of histamine on the heart and coronary vessels. Jour. Pharmacol. and Exper. Therap., 29:325-337, 1926.
34. Hamman, Louis: The symptoms of coronary occlusion. Bull. Johns Hopkins Hosp., 38:273-319, 1926.
35. Hardt, L. L.: Coronary thrombosis simulating perforated peptic ulcer. Jour. A.M.A., 82:692-695, (Mar. 1) 1924.
36. Hausner, Erich, Essex, H. E., Herrick, J. F., and Baldes, E. J.: Control of coronary blood flow in the heart-lung preparation. Am. Jour. Physiol., 131:43-54, (Nov.) 1940.
37. Herrick, J. B.: Clinical features of sudden obstruction of the coronary arteries. Jour. A.M.A., 59:2015-2020, (Dec.) 1912.
38. Herrick, J. F., Essex, H. E., Mann, F. C., and Baldes, E. J.: The effect of digestion on the blood flow in certain blood vessels of the dog. Am. Jour. Physiol., 108:621-628, (June) 1934.
39. Katz, L. N., Jochim, K., and Weinstein, W.: The distribution of the coronary blood flow. Am. Jour. Physiol., 122:252-261, (Apr.) 1938.
40. Kerr, W. J., Larkey, S. V., and Larsen, A. E.: Coronary occlusion and myocardial degenerations; some clinical and pathological considerations. California and West Med., 23:46-51, (Jan.) 1925.
41. Klionsky, Georges: A case of ischemic necrosis of the heart muscle showing evidence of embolism elsewhere. Lancet, 1:74, (Jan. 9) 1926.
42. Leary, Timothy: Pathology of coronary sclerosis. Am. Heart Jour., 10:328-337, (Feb.) 1935.
43. Leary, T., and Wearn, J. T.: Two cases of complete occlusion of both coronary orifices. Am. Heart Jour., 5:412-423, (Apr.) 1930.
44. Levine, S. A.: Coronary thrombosis: its various clinical features. Medicine, 8:245-418, (Sept.) 1929.
45. Levine, S. A., and Tranter, C. L.: Infarction of the heart simulating acute surgical abdominal conditions. Am. Jour. Med. Sci., 155:57-66, (Jan.) 1918.
46. Levy, R. L.: Mild forms of coronary thrombosis. Arch. Int. Med., 47:1-18, (Jan.) 1931.
47. Libman, E., and Sacks, B.: A case illustrating the leukocytosis of progressive myocardial necrosis following coronary artery thrombosis. Am. Heart Jour., 2:321-326, (Feb.) 1927.
48. Longcope, W. T.: The effect of occlusion of the coronary arteries on the heart's action and its relationship to angina pectoris. Wisconsin Med. Jour., 20:449-455, (Feb.) 1922.
49. Mallory, G. K., White, P. D., and Salcedo-Salgar, Jorge: The speed of healing of myocardial infarction. A study of the pathologic anatomy in seventy-two cases. Am. Heart Jour., 18:647-671, (Dec.) 1939.
50. McNee, J. W.: The clinical syndrome of thrombosis of the coronary arteries. Quart. Jour. Med., 19:44-52, (Oct.) 1925.
51. Moe, G. K., and Visscher, M. B.: The mechanism of failure in the completely isolated mammalian heart. Am. Jour. Physiol., 125:461-473, (Mar.) 1939.
52. Montgomery, Hamilton and Osterberg, A. E.: Xanthomatosis. Correlation of clinical, histopathologic and chemical studies of cutaneous xanthoma. Arch. Dermat. and Syph., 37:373-402, (Mar.) 1938.
53. Nelson, M. G.: Intimal coronary artery hemorrhage as a factor in the causation of coronary occlusion. Jour. Path. and Bact., 53:105-116, (July) 1941.
54. Oberhelman, H. A., and LeCount, E. R.: Variations in the anastomosis of the coronary arteries and their sequences. Jour. A.M.A., 82:1321-1325, (April 26) 1924.
55. Pardee, H. E. B.: An electrocardiographic sign of coronary artery obstruction. Arch. Int. Med., 26:244-258, (Aug.) 1920.
56. Pardee, H. E. B.: Complete clinical recovery after thrombosis of a coronary branch. Am. Heart Jour., 2:442-445, (Apr.) 1927.
57. Parkinson, John and Bedford, D. E.: Successive changes in the electrocardiogram after cardiac infarction (coronary thrombosis). Heart, 14:195-239, (Aug.) 1928.
58. Paterson, J. C.: Some factors in the causation of intimal hemorrhages and in the precipitation of coronary thrombi. Canad. Med. Assn. Jour., 44:114-123, (Feb.) 1941.
59. Smith, F. M.: The ligation of the coronary arteries with electrocardiographic study. Arch. Int. Med., 22:8-27, (July) 1918.
60. Smith, F. M.: Concerning the anatomy of the coronary arteries. Am. Jour. Med. Sci., 516:706-711, (Nov.) 1918.
61. Standardization of precordial leads. Am. Heart Jour., 15: 107-108, (Jan.); 235-239, (Feb.) 1938.
62. Sutton, D. C.: The effects of temporary occlusion of the coronary arteries. Jour. Clin. Investigation, 7:305, (June) 1929.
63. Visscher, M. B.: The restriction of the coronary flow as a general factor in heart failure. Jour. A.M.A., 113:987-990, (Sept. 9) 1939.
64. Wearn, J. T.: Thrombosis of the coronary arteries with infarction of the heart. Am. Jour. Med. Sci., 165:250-276, (Feb.) 1923.
65. Wearn, J. T.: The extent of the capillary bed of the heart. Jour. Exper Med., 47:273-292, (Feb.) 1928.
66. Wearn, J. T.: The rôle of the Thebesian vessels in the circulation of the heart. Jour. Exper. Med., 47:293-316, (Feb.) 1928.
67. Wedd, A. M.: Painless coronary occlusion. New York State Jour. Med., 28:1091-1095, (Sept. 15) 1928.
68. Wegria, R. G. E., Essex, H. E., Herrick, J. F. and Mann, F. C.: Simultaneous observations on the blood flow of both right and left coronary arteries of anesthetized dogs— effect of drugs. Am. Jour. Physiol., 126:P651, (July) 1939.
69. White, J. H. and Patmos, M.: Unpublished data.
70. White, P. D.: The prognosis of angina pectoris and of coronary thrombosis. Jour. A.M.A., 87:1525-1530, (Nov. 6) 1926.
71. Whitten, M. B.: A review of the technical methods of demonstrating the circulation of the heart. A modification of the celluloid and corrosion technic. Arch. Int. Med., 42:846-864, (Dec.) 1928.
72. Whitten, M. B.: A comparison of the blood supply of the right and left ventricles in childhood. Arch. Int. Med., 45: 46-58, (Jan.) 1930.
73. Whitten, M. B.: The relation of the distribution and structure of the coronary arteries to myocardial infarction. Arch. Int. Med., 45:383-400, (Mar.) 1930.

74. Wiggers, C. J.: In Levy, R. L.: Diseases of the coronary arteries and cardiac pain, pp. 61-68. New York: The Macmillan Company, 1936.
75. Wiggers, C. J. and Cotton, F. S.: Studies on the coronary circulation. II. The systolic and diastolic flow through the coronary vessels. Am. Jour. Physiol., 106:597-610, (Dec.) 1933.
76. Willius, F. A.: Observations on negativity of the final ventricular T wave of the electrocardiogram. Am. Jour. Med. Sc., 160:844-865, (Dec.) 1920.
77. Willius, F. A.: Angina pectoris. An electrocardiographic study. Arch. Int. Med., 27:192-223, (Feb.) 1921.
78. Willius, F. A.: Electrocardiography as a diagnostic adjunct in the anginal syndrome of coronary sclerosis. Proc. Twenty-fourth Ann. Meeting, American Life Convention, 1934.
79. Willius, F. A.: Life expectancy in coronary thrombosis. Jour. A.M.A., 106:1890-1894, (May 30) 1936.
80. Willius, F. A.: Cardiac clinics LXV. A talk on the sex discrepancy in coronary disease. Proc. Staff Meet., Mayo Clin., 14:751-752, (Nov. 22) 1939.
81. Willius, F. A.: Coronary disease and life insurance. Proc. Assn. Life Insur. Med. Dir. America (1939), 26:215-236, 1940.
82. Wilson, F. N., Macleod, A. G., Barker, P. S., Johnston, F. D., and Kolstermeyer, L. L.: The electrocardiogram in myocardial infarction with particular reference to the initial deflections of the ventricular complex. Heart, 16:155-199, (June) 1933.
83. Wolferth, C.C., and Wood, F. C.: The electrocardiographic diagnosis of coronary occlusion by the use of chest leads. Am. Jour. Med. Sci., 183:30-35, (Jan.) 1932.
84. Wolferth, C. C., and Wood, F. C.: Further observations upon the use of the chest leads in the electrocardiographic study of coronary occlusion. Med. Clin. N. A., 16:161-167, (July) 1932.
85. Wolff, Louis, and White, P. D.: Acute coronary occlusion: report of twenty-three autopsied cases. Boston Med. and Surg. Jour., 195:13-25, (July 1) 1926.

NEUROPSYCHIATRY THEN AND NOW

E. M. HAMMES, M.D.
Saint Paul, Minnesota

MINNESOTA MEDICINE was born and christened during the first World War, and is celebrating its Silver Anniversary in the midst of the second World War.

The progress that MINNESOTA MEDICINE has made during this period in its scientific contributions, in its volume of publications and in its continued high ethical standards should be a great source of pride to every member of our State Medical Association. MINNESOTA MEDICINE has been fortunate throughout these years in having as its editors men of unusual professional skill and untiring energy. The editing and publishing committee wants to take this opportunity to express their appreciation to these editors, who have in a large measure been responsible for making MINNESOTA MEDICINE one of the outstanding state medical journals of this country.

During this period, neuropsychiatry, including neurosurgery, has made remarkable progress. The diagnosis and treatment of the various neuropsychiatric disorders has been placed on a higher and more scientific plane than ever before. A more thorough undergraduate training in every field of medicine, including that in neuropsychiatry, has emphasized to the medical profession as a whole the importance of this special field, and has made possible the diagnosis and proper treatment of many of these interesting problems.

The establishment of a psychiatric unit at the University Hospital of the Medical School of the University of Minnesota, in 1937, has given our medical students ample opportunity to observe the various psychiatric disorders, to diagnose them and to note the effect of proper treatment. Prior to that time, clinics in psychiatry were conducted only at the Ancker Hospital in Saint Paul and the General Hospital in Minneapolis. Invariably the clinical material was limited, and the period for observation confined to that clinic hour. There was no time for further study and for the psychiatric and psychologic treatment of the individual patient. This psychiatric unit has filled a very important place in our medical curriculum and has resulted in great benefit to unfortunate mental patients in the state of Minnesota.

The Child Guidance Clinics, established in the various large centers in this state in 1924, have assisted in solving many of the behavior problems, the child delinquencies, the distressing parent-child relationships and other serious childhood conflicts.

The universal application of the chemical and dynamic studies of the spinal fluid, the better understanding of the various neuropsychiatric syndromes associated with endocrine dysfunction, and the more thorough knowledge of the chemical structure and of the electric potentials of the central nervous system have become important cogs in our diagnostic armamentarium.

The advances made in the field of neurosurgery in intracranial and spinal neoplasms, in operations on the sympathetic nervous system and in the treatment of cerebral injuries surpass every other surgical field, not only in scientific ingenuity but also in therapeutic results.

The introduction of lipiodol for the diagnosis of obstructive spinal cord lesions, and the development of the encephalogram and ventriculogram have resulted in earlier and more accurate localization of cord and brain tumors and other obscure cerebrospinal diseases.

The recognition of shock, of the various types of traumatic intracranial hemorrhage and of the depressed fractures in cerebral injuries along with the development of proper treatment, have reduced the mortality rate in this rather frequent accident from 52 per cent to as low as 8 to 12 per cent in some clinics.

During the early era of Minnesota Medicine, the medical profession passed through a period of the indiscriminate use of the various endocrine extracts. Gradually this was placed on a more scientific and rational basis. Today, twenty-five years later, we are in the midst of a vitamin boom, and the public, our patients, are paying an enormous price for this experiment. Undoubtedly the various vitamins are playing an important role in the development and treatment of certain specific diseases, but their indiscriminate use should be discouraged. It has been quite definitely established that deficiency in vitamin B_1 produces polyneuritis and that lack of vitamin B_2 produces pellagra, not infrequently associated with a psychosis. Experimental studies have further demonstrated degenerative lesions in the central nervous system caused by marked vitamin B_1 deficiency. Similarly, alcoholic polyneuritis is evidently due to a B_1 avitaminosis, and not to any toxic effect of alcohol. Treatment along these lines has produced excellent results.

A rich vitamin diet, with emphasis on nicotinic acid, has resulted in prompt recovery from the cutaneous lesions and also the psychiatric manifestations in pellagra. The early encouraging reports in the treatment of progressive muscular dystrophy with vitamin C and of amytrophic lateral sclerosis with vitamin E have not been confirmed in later studies, and no definite progress has been made in the therapy of these disabling diseases. Yungblut believes that vitamin C may play a neutralizing role in preventing virus infections of the central nervous system. He bases his opinion on experimental work done on monkeys in whom paralytic doses of poliomyelitis virus mixed with small amounts of crystalline vitamin C were injected intracerebrally. No paralytic symptoms developed.

In the winter of 1917, epidemic encephalitis first became prevalent on the European continent and gradually involved the entire civilized world. The first cases in Minnesota were observed in the early summer of 1919, and within five years over 4,000 patients had suffered from this disabling disease in this state. Since then extensive studies experimentally and clinically have been unable to determine a definite etiologic factor (a virus infection) or to suggest a prophylactic or immunizing measure or to develop a successful therapy. Benzedrine sulfate, stramonium or belladonna may relieve some of the distressing sequelæ.

In acute anterior poliomyelitis, the results have been just as discouraging except that the recent Kenny treatment offers a more hopeful outlook and a greater number of recoveries. With the introduction of sulfanilamide in 1935, and its allied compounds, remarkable therapeutic results have been obtained in some of the pyogenic infections of the central nervous system. The mortality rate in meningococcus meningitis has been reduced from 45.9 per cent to as low as 9 per cent. The serious sequelæ have also been materially lessened. In a mild epidemic in Great Britain, in 1941, the results were even more favorable. Streptococcus and pneumococcus meningitis have shown similar satisfactory results but not to the same extent. The virus infections, however, remain resistant to this treatment.

With the introduction of salvarsan by Ehrlich, in 1910, the treatment of syphilis was placed on a more rational basis, and the tendency for involvement of the nervous system greatly lessened.

In the treatment of parenchymatous syphilis the various forms of salvarsan were largely replaced by tryparsamide, prepared by Jacobs and Heidelberger in 1917. The various forms of fever therapy, particularly the malarial treatment for general paresis instituted by Wagner von Jauregg in 1918, have materially improved our therapeutic results. Hyperpyrexia induced by intravenous injections of triple typhoid or by electricity, has produced favorable results in various neurological disorders, particularly in acute chorea.

Among other therapeutic measures developed during this period are the addition of dilantin in the treatment of epilepsy, the use of ergotamine tartrate or ergonovine in the relief of at-

tacks of migraine, and Fürstenberg's treatment for Mèniére's disease, which has produced satisfactory results. Fürstenberg's treatment consists mainly in an absolutely sodium chloride free selected diet, with large doses of ammonium chloride in capsules and some mild sedative. In the more resistant cases surgical section of the auditory nerve has proven successful.

The treatment of narcolepsy with benzedrine sulfate has given satisfactory results in relieving the attacks of uncontrollable sleep. Myotonia congenita, with its inability to contract and relax voluntary muscles, has been greatly benefited by the use of quinine hydrochloride, and the marked muscle fatigability due to myasthenia gravis has been relieved and the tendency to remissions increased by the administration of prostigmin and glycine.

The pioneer work of Berger in developing the electro-encephalograph and the resultant studies in normal and abnormal electric activities of the cerebral cortex have increased our knowledge of and our diagnostic ability in many cerebral disorders. Gibbs and Lennox have demonstrated that epilepsy is a paroxysmal dysrhythmia and that the three main types of epilepsy produce distinct abnormal cerebral rhythms. Electro-encephalography also aids in differentiating organic from functional post-traumatic cerebral conditions, symptomatic from essential types of epilepsy and from hysterical convulsions, and in the localization of cerebral neoplasms.

Surgical measures have finally been devised for the relief of pain in many of the chronic neurological disorders. Local alcohol injection or the radical sensory root resection in trifacial neuralgia have given relief to many intense sufferers. Similar results have been obtained in other prolonged neuralgias by the intraspinal section of the posterior roots. The surgical removal of a protruded intravertebral disc has alleviated the pain and allied symptoms in many cases of sciatica. The epidural or subarachnoid injection of absolute alcohol for the relief of pain in metastatic involvement of the nerve plexuses or the spinal cord is a simple and quite effective procedure. In some cases, however, section of the pathways for pain in the spinal cord, as suggested by Spiller, must be resorted to.

The problem of the care and treatment of the psychoses is still a major one, particularly among the military forces during and after a World War period. The recent shock treatments with insulin, metrazol and electricity for the functional psychoses have increased the percentage of remissions and have shortened the period of hospitalization. Sufficient time has not elapsed to definitely determine whether these remissions will be of longer duration and whether the relapses will be less frequent than with previous forms of therapy. That is the ultimate criterion.

In World War I, neuropsychiatric disabilities constituted about 30 per cent of the disabilities from which soldiers suffered. The cost to the Government of caring for these men, disabled from this cause during the war, including treatment, disability allowances and pensions, has been to date approximately $950,000,000, an average of $30,000 per man so disabled. Many of these men are still confined in Government Hospitals and will be so permanently. It has been estimated that 96 per cent of these disabilities were considered to have arisen *not* in line of duty. In 1927 almost 50 per cent of all patients receiving hospital treatment as beneficiaries of the United States Veterans' Bureau were neuropsychiatric cases.

Neuropsychiatric disabilities in the American Expeditionary Forces became so prevalent that General Pershing, in the spring of 1918, cabled Washington, requesting more careful and thorough neuropsychiatric examination before sending soldiers overseas. In Base Hospital No. 99 A.E.F., where the writer had charge of the neuropsychiatric service, many cases were encountered whose family histories revealed a marked neurotic trait or definite evidence of previous personal emotional or psychiatric instability. Experiences in World War I and previous wars have definitely proven that an individual who succumbs to the ordinary stress of civil life is unable to cope with the strict military discipline, exposures, fatigue and emotional strain of active warfare. Many of these individuals would have been able to carry on quite successfully as useful, self-supporting citizens in civil life. To a much greater extent will this be true in the highly mechanized blitz-krieg of World War II. Military service today demands more emotional stability and intellectual activity than ever before.

In the light of these past experiences, the duties and responsibilities of the neuropsychiatrist in this great conflict are multiple indeed.

Fortunately our country today is equipped with a greater number and more highly trained physicians in this special field. More induction boards are able to have their services. A more thorough understanding of the personality make-up of the individual and better methods of examination will undoubtedly result in an Army more thoroughly equipped psychologically, emotionally and intellectually. This will greatly increase the morale of our Army and should materially lessen our war neuropsychiatric casualties. If the leaders of the United Nations will strive as diligently and diplomatically for a just and lasting peace as our soldiers are fighting for an ultimate victory, MINNESOTA MEDICINE will publish its Golden Anniversary journal among more tranquil and happier surroundings.

ENDOCRINOLOGY IN THE LAST QUARTER OF A CENTURY

MAX. H. HOFFMAN, M.D.
Saint Paul, Minnesota

THE term "internal secretion" was first used by Claude Bernard in 1852. About five years earlier Berthold showed for the first time that a substance produced in one part of the body could act on tissue at a distant point. From the time of these earliest observations until the period under discussion, important contributions to the field were not numerous. Outstanding were the names of Graves, Basedow, Gull, Riverdin, and Kocher, in their contributions to the knowledge of thyroid diseases. Pierre Marie described acromegaly and von Mering and Minkowski produced experimental diabetes mellitus by extirpation of the pancreas. Other individuals of importance were Brown-Sequard with his injection of testicular extracts; Gley, whose studies showed a relationship between the removal of the parathyroids and tetany; and the work of Oliver, Schaeffer, and Takamine on the adrenal medullary function.

The above list of names does not at all include all those who made earlier important contributions, but the observations of these men were about all that was familiar to the student of twenty-five years ago. When one realizes that most of what we now know in endocrinology is the result of the investigations of the last twenty-five years, we can easily understand that it is really a new field in medicine. The development that has taken place in endocrinology has not been due to the research efforts of any one group of investigators, but credit must be given principally to the biologist, the physiologist, and the biochemist. Although the contributions by the clinician have been numerous, they have not been as important as those of the other groups. In fact this failure of clinical medicine to keep abreast with the advancement of the other workers has been quite striking.

The Pituitary Gland

Although Pierre Marie described acromegaly in 1886, and Minkowski in 1887 demonstrated its relationship to tumors of the pituitary gland, nothing was known about the mechanism that produced the characteristic overgrowth of bone and soft tissue. Even as late as 1922, Falta, in discussing the condition, enumerated the various theories advanced to explain the acromegalic changes. He stated it to be his belief, on the basis of clinical studies, that the changes are due to the effect of the pituitary gland on growth, but that there was no experimental evidence to confirm that belief. In 1929, Putnam, Benedict, and Teel produced acromegaly in a dog by the injection of a growth extract secured from the anterior pituitary gland. This work conclusively proved that the pituitary tumor of acromegaly produced an excessive amount of growth hormone.

Recent investigation has shown that the pituitary gland possesses several functions other than growth control. At least six hormones have been extracted in recent years.

In 1926, Ascheim and Zondek, and Philip Smith, working independently, discovered that the anterior pituitary gland has a marked effect on the development of the ovaries in mice and rats. This together with the knowledge that extirpation of the anterior pituitary gland in young animals produces dwarfism and sexual infantilism conclusively demonstrated the part played by the gland in sexual maturation.

This sex stimulating hormone (gonadotropic) was found by Ascheim and Zondek in the urine of pregnant women and forms the basis for the test of pregnancy. The hormone found in pregnancy urine was found to be somewhat different, in its effect, from that secured from the pituitary gland itself, and is now believed to be formed in the chorionic tissue. Although it is believed there are two gonadotropic hormones, a follicle stimulating and a second luteinizing hormone, they have not as yet been separated. The gonadotropins have been rather disappointing in their therapeutic effects, although they have a definite but limited place in endocrine treatment. Recent observations with more potent preparations indicate possibly an increased therapeutic usefulness for these substances.

The anterior lobe of the pituitary gland has been shown to produce several other hormones. These are the thyrotropic hormone, the lactogenic, diabetogenic, adrenotropic, and the parathyrotropic factors of the anterior lobe. The isolation of all of these substances together with the growth and gonadotropic hormones is the result of research in this field beginning about 1925. Although the discovery of these hormones have not as yet greatly improved our attempts at endocrine therapy, they have added immensely to our knowledge of pituitary function and endocrine diagnosis.

In the last twenty-five years only one new syndrome has been ascribed to pituitary gland disorder. The condition described by Cushing in 1932 is now known as "Cushing's syndrome" or "pituitary basophilism." Cushing believed the condition was due to a basophilic tumor of the anterior pituitary lobe. The symptoms characteristic of this condition are very similar to those produced by overactivity of the adrenal cortex, and many clinicians do not agree with Cushing that the disease originates in the pituitary gland.

The Thyroid Gland

There was more known about the thyroid gland twenty-five years ago than of any other gland of internal secretion. No significant advances have been made in the last quarter of a century in regard to medical management and diagnosis of diseases of this organ. When Kendall, in 1915, isolated a crystalline substance from the thyroid colloid which he called "thyroxin," it was felt by many that this was not the true thyroid hormone. Recent investigation has not revealed unequivocal evidence that there is any other substance which is responsible for its activity.

An important recent contribution to our understanding of thyroid physiology has been the finding that the anterior lobe of the pituitary gland produces a hormone, or hormones (thyrotropic factor) that affect the thyroid gland. Continuous injections of this hormone in animals can produce exophthalmos and other evidence of Grave's disease. Thus, for the first time, exophthalmic goiter has been produced experimentally. However, antihormones are developed in a relatively short time, and the induced hyperthyroidism regresses.

The significance of the part played by this hormone in clinical exophthalmic goiter cannot as yet be evaluated. It is possible that persistent exophthalmos following subtotal thyroidectomy may be caused by an oversecretion of this hormone.

Parathyroid Glands

Although the parathyroid glands were discovered in 1880, the relationship of the parathyroids to calcium metabolism and tetany was not suspected until 1907, when the pathologist Erdheim noticed that a definite association existed between parathyroid tumors and skeletal decalcification. In 1908 and 1909, MacCallum and Voigtlin conclusively showed that tetany in parathyroidectomized dogs was due to a lower blood calcium. In spite of these observations it was still believed by many that the main function of the parathyroid glands was to detoxify poisons in the body, particularly guanidine.

Definite proof that the function of these glands was to control calcium and phosphorus metabolism and not to detoxify, was available with the isolation of the parathyroid hormone by Hanson in 1924 and Collip in 1925. This hormone is markedly effective in raising the blood level of calcium in hypoparathyroid tetany. Its exact mode of action in altering calcium metabolism is not as yet known.

The anterior lobe of the pituitary gland secretes a hormone (parathyrotropic) that stimulates these glands. It has never been recovered in pure form. No clinical syndrome is attached to alterations of the parathyrotropic hormone al-

hough the osteoporotic changes in Cushing's lisease are supposed to be due to the overpro- luction of this hormone.

Considerable advancement has taken place in he treatment of hypoparathyroidism and its at- endant hypocalcemia. Although the milder cases an be satisfactorily taken care of with calcium lone, the parathyroid hormone and hytakerol ave been very effective in raising the blood cal- ium in the severe cases. Hytakerol, formerly nown as "A.T.10" was first used by Holtz in 1934 and is derived from irradiated sterols. When given orally it has a marked action in raising the blood calcium.

In 1925, Mandl removed a parathyroid tumor n a case of osteitis fibrosa cystica with remarkable results. He first definitely established the rela- ionship between von Recklinghausen's disease of the bones and an overfunctioning tumor of he parathyroid gland. His observations received confirmation from many sources, and much work as been carried out on many phases of hyper- parathyroidism since that time.

The Pancreas

Following the observations of von Mering and Minkowski, in 1889, that diabetes resulted when the pancreas was removed from dogs, numerous investigations contributed to the various aspects of this disease. Although twenty-five years ago it was felt that the islands of Langerhans se- creted the antidiabetic hormone, no method of extracting this hormone from the pancreas was successful because of the autolytic action of its external secretion. In 1920, Barron made the observation that when the pancreatic duct was obstructed, the cells forming the external secre- tion degenerated and the island cells were left intact. From this observation Banting and Best, in 1922, were able to extract from the pancreas a substance which when injected into dogs was ca- pable of lowering the blood sugar. This hor- mone, which was named insulin, revolutionized the treatment of diabetes mellitus. Its use has made it possible for thousands of diabetics to lead comfortable and useful lives. This discov- ery without question has been one of the most important in medical history.

The mode of action of insulin is not clear in all its details. A much debated point as to whether insulin takes part in the oxidation of carbohydrates is still to be settled. Some of the actions of this hormone are very clear, such as the part it plays in the formation and deposition of glycogen in the liver.

The relation between the pancreas and the an- terior pituitary gland has assumed great im- portance since Houssay showed that the pituitary gland has a very definite inhibitory action on the production or activity of insulin.

Following Houssay's observations, Young in 1940 produced severe permanent diabetes in dogs and cats by the injection of extract of the ante- rior pituitary lobe. This type of diabetes simu- lates in many respects the disease as it occurs in humans. No definite evidence has as yet been found to prove that the diabetes mellitus seen clinically is due to pituitary disturbance. How- ever, the diabetes seen so frequently in associa- tion with acromegaly may well be produced by such a mechanism.

The disturbances in fat metabolism associated with diabetes mellitus is not always influenced by the action of insulin. For this reason it is felt by some that the pancreas must secrete another hormone. Dragstad isolated from the pancreas a substance which is called "lipcaiac" that appears to have some action in the mobilization of fat, and, in particular, has an effect in reducing the fat infiltration in the liver in severe diabetes. It has not been very effective according to clinical reports.

The Adrenal Gland

The adrenal is formed by two separate and distinct endocrine organs—the medulla which is not essential to life, and the cortex which is most essential.

The Adrenal Medulla.—Very little advance has been made in our knowledge of the physiology or disturbances of the adrenal medulla in the past twenty-five years. The controversy between Cannon and his followers, and Stewart and Ro- goff, regarding the function and action of the adrenal medulla has never been definitely set- tled. Cannon's emergency theory that contends the adrenal medulla functions only under condi- tions of emotional stress and has little or no function at other times has been generally ac- cepted.

The Adrenal Cortex.—In one of the master- pieces of medical literature Thomas Addison in 1855 described the symptom-complex now known as Addison's disease. He noted the association of

this syndrome characteristic of the disease with pathological changes in the adrenal gland. Little of importance has been added since that time, either to the clinical picture or essential pathological disturbances. In recent years we have learned a great deal about the physiology of the adrenal cortex and its abnormal functioning in Addison's disease, and also about the therapeutic management of this condition. All of this has come about in the last fifteen years.

Baumann, Kurland, and Marine showed that the blood of adrenalectomized cats had a low sodium and a high potassium content, and that the administration of sodium prolonged their lives. Later it was shown that individuals with Addison's disease showed the same blood findings, and if the sodium intake was lowered, a critical condition was produced. Thus it was shown that one of the functions of the adrenal gland was to prevent a loss of sodium and water through the kidneys, and to control the excretion of potassium.

These observations have led to important diagnostic and therapeutic advances in the management of adrenal cortical insufficiency. The salt deprivation tests in doubtful cases has considerable value, and the low potassium and high sodium diet is usually very effective in treatment.

The importance of the adrenal cortex in carbohydrate metabolism is now receiving greater appreciation than ever. It is probably the main organ concerned with the conversion of proteins into carbohydrates (neoglucogenesis).

Its antagonism to the action of insulin is demonstrated by the sensitiveness of patients with Addison's disease to the action of insulin.

No single hormone has been isolated from the adrenal cortex that is capable of producing all of its effects. For that reason some believe that this gland produces several hormones, one, for example, which effects the electrolyte metabolism and another which acts on the carbohydrate metabolism. A third hormone also is present which will be discussed later.

The adrenal cortical extracts produced in 1928 by Hartman, Pfiffner, Swingle and others have definite effects on the water, electrolyte and carbohydrate metabolism. These extracts are now available commercially but have limited value because of their low potency and high cost.

One of the numerous substances isolated from the adrenal cortex is desoxycorticosterone. Its effect is almost entirely on water and electrolyte metabolism. In 1937, Reichstein synthesized this substance and it has proven of immense value in the treatment of Addison's disease. The present trend of investigation indicates the possibility that we may have in the near future a preparation more satisfactory than anything that we now possess.

The Adrenal Genital Syndrome.—In 1910, Alpert noticed the frequent association between general hirsutism and adrenal cortical tumors. This observation has since been noted many times. There is now ample evidence that the adrenal cortex is in some way concerned with sexual development. Its mode of action is not well understood. The masculinizing sex hormone produced by this gland is known as dehydroisoandrosterone and is related chemically to the other androgens such as testosterone and androsterone. Unconfirmed reports indicate that this substance might be the precursor of testosterone and that the transformation takes place in the testis. In conditions of sex reversal changes associated with adrenal tumors very large amounts of this hormone are found in the urine.

The adrenal cortex also produces an estrogen and several cases of feminization in the male have occurred in association with adrenal cortical tumors.

The Gonads

Certainly the earliest endocrinological observations must have been the effects of castration in the male. As was mentioned before, the conclusion of Berthold that the testis produced a secretion capable of altering the cocks comb was the first evidence of hormone activity. Little knowledge was forthcoming regarding sexual development or gonadal physiology until P. E. Smith, in 1926, showed that following hypophysectomy, the gonads atrophied, and that this atrophy could be prevented by implantation of anterior pituitary tissue.

Following these observations a great deal of work by numerous investigators led to the isolation of a pituitary hormone that was effective in stimulating the activity of the gonads. Later it was found that a pituitary-like hormone could be secured from pregnancy urine or from the blood of pregnant mares. This hormone differs in some respects from that secured from the gland itself.

Further research on the relationship between

ıe gonads and the pituitary gland has established ıe importance of the pituitary in its effect on ɔrmal and abnormal physiology of the gonads. 'he relationship is reciprocal in nature, the go- adal secretion acting in an inhibitory manner on ıe production of the gonadotropic hormone. 'ollowing the reduction of gonadal activity such s in castration or menopause, there is an over- roduction of gonadotropins. This is supposed to e responsible for the disturbances that occur in ıenopause.

The Ovary.—Until recent years our informa- ıon regarding the normal and abnormal func- ıoning of the ovaries was practically nil. There s much still to be learned, particularly regarding ıenstrual abnormalities and uterine bleedings of arious types, and their relation to ovarian hor- ıone disturbances.

Our present knowledge of the hormones which ontrol menstruation has been acquired in the ɔast ten years. Allen and Doisey in 1922 first howed that a substance could be extracted from he ovary which could establish an estrus cycle n castrated rats. In 1927 Ascheim and Zondeck lemonstrated this substance in large amounts in he urine of pregnant animals. In 1929 Doisey nd Butenandt independently crystallized this ıormone and prepared the field for chemical dentification of the estrogenic hormones. The strogen estradiol has been isolated from the fol- icle, and is presumed to be the active ovarian strogen. This hormone is capable of producing ɔnly the proliferative or first phase of the men- strual changes in the endometrium. The second ɔhase or the secretory stage is brought about by he hormone of the corpus luteum.

The main therapeutic usefulness of the estro- genic hormone has been in the treatment of the menopausal syndrome and in this condition it has been most valuable.

The substance produced by the corpus luteum, which exerts the specific effect on the endo- metrium, was first extracted in 1929. In 1934 several investigators simultaneously produced it in a pure form and revealed its chemical struc- ture. It is now produced synthetically and known as "progesterone." It has been used with some success in habitual and threatened abortion and also in various types of uterine bleeding.

The two hormones, estrogen and progesterone, when used in adequate amounts at the proper in- terval, can produce in the uterus the entire men- strual cycle.

The Testis.—McGee, in 1927, extracted from the bull's testis a substance with comb growth properties. In 1931 Butenandt succeeded in pre- paring in a crystalline form the male sex hormone from human urine. Previous to that time nu- merous unsuccessful attempts were made to pre- pare an active male sex hormone. Later, in 1934, Laquer isolated the same hormone from the testis itself. This hormone has been given the name "testosterone." Whether this is the only hormone produced by the testis is still open to question. As yet, however, no other has been found. Sev- eral other substances with androgenic action but inferior in their potencies to testosterone have been found in the urine and adrenal cortex. However, it is now definite that the testis is the main source, if not the only one, of testosterone.

This hormone now produced synthetically is capable of restoring the secondary sex characters resulting from loss of testicular function. It can bring about sexual maturation in the undeveloped male if given in adequate amounts. The clinical field of usefulness for this preparation is, how- ever, rather limited.

This review of the developments in endocrin- ology in the last twenty-five years is in no sense a complete compilation of all the work that has gone on in recent years and which is being car- ried out at this time. Such a task would be enor- mous. An attempt has been made to mention the most important contributions, but even here the work of many investigators who have added significantly to our knowledge has not been touched upon.

AWARDS ESTABLISHED TO FURTHER RESEARCH ON CELLS

Creation of two new prize awards for research adding to knowledge of factors affecting the growth of cells with particular reference to human cancer is an- nounced by Dr. William J. Robbins, chairman of the National Science Fund of the National Academy of Sciences. The prizes are to be known as the Charles L. Mayer Awards.

"One prize of $2,000 will be awarded for a contribu- tion published in 1942 or submitted in manuscript to the National Science Fund," Dr. Robbins stated, "and a similar prize in 1943. The Charles L. Mayer Awards are a new type of award in that they will be given to further the scientific work of the recipient. They are not only rewards for past accomplishments but are also de- signed to increase the opportunities of those with excep- tional abilities to carry on further research."—*Science News Letter,* December 5, 1942.

PREVENTIVE PEDIATRICS IN PRIVATE PRACTICE

E. J. HUENEKENS, M.D.
Minneapolis, Minnesota

A DISCUSSION of the progress of pediatrics in the past quarter century could be developed from several different angles. Many or all of the following samples might well be headlined as leaders in such progress. Stress might be laid on the recent discoveries in the diagnosis of epilepsy (electro-encephalography) or its treatment (dilantin). One might dilate on the newer knowledge of the anemias of the newborn and their treatment. Also we are on the verge of a better understanding of asphyxia neonatorum with a growing concept of the dangers of maternal anesthesia and analgesia to the newborn infant. As another sample we have found that the administration of Vitamin K immediately after birth will control many of the hemorrhagic diseases of the newborn. Again the death rate among premature babies has been dramatically reduced by improved care and feeding and the wise use of air conditioned surroundings. The great advances wrought in the treatment of various acute infections by the sulfonamides might well be considered the most important event of the last twenty-five years. Finally, one might nominate as the outstanding advance in pediatrics today what Powers[3] calls supportive therapy. In a paper entitled "Developments in Pediatrics in the Past Quarter Century," he says:

> "By supportive therapy I mean procedures which might be termed physiological treatment since they are directed toward correcting physiological disturbances rather than to eliminating causes of disease. I refer particularly to the use of parenteral fluids such as blood, blood serum, and normal salt, special electrolyte, and glucose solutions. Now, as never before, we realize that a baby can tolerate tremendous physical trauma but he cannot endure fluid and salt deficits without exhibiting the train of serious symptoms we associate with the terms dehydration, electrolyte imbalance, and shock."

In the long view, great as these advances are, preventive pediatrics is of even greater importance and will perhaps blaze a path for other branches of medicine to follow. The increase in life expectancy in the last twenty-five years is due, in large part, to the decrease in infant mortality. In Minnesota the infant death rate has fallen from 70.1 in 1915 to 33.3 in 1940. The drop in the mortality of infants under one month of age (the neonatal period) has remained virtually stationary during that time, while practically all reduction has been from the ages of one to twelve months. Our increasing knowledge of nutrition and other prophylactic measures must be credited with the largest part of this reduction.

Modern medicine is stressing more and more the prevention of disease. Many phases of prevention must be performed by public health agencies, but there remain a large number which can best be conducted by physicians in private practice; though I admit the majority of physicians are not alert in carrying them out. Partly this is due to the neglect of our medical schools in teaching prevention in private practice. The average doctor persists in thinking that the care of the sick is his sole function. I have heard medical men on many occasions scoffing at well-baby care by pediatrists as a "racket." It is common to hear an old-fashioned doctor query, "Why vaccinate against smallpox or inoculate against diphtheria when there is no epidemic?" Several years ago the Community Health Service made a survey of the cases that had been discharged from its clinics because the financial situation of the parents had improved and they were able to pay a private physician for well-baby care. As a result of this survey the organization was forced to conclude that most general practitioners do not appreciate the importance of regular and complete physical examination of the well child. Some of the comments of the mothers were quite illuminating: "My doctor weighed the child only. We feel we cannot afford to pay $2.00 for weighing the child when we can get that done down at the corner store." "When I took my child for vaccination and inoculation for diphtheria he said to wait until the child reached school age." One mother had to ask the doctor if he did not want her to undress the children. His reply was, "No, they look fine." A very common comment from the doctor is that he was too busy to bother with well children.

I presume that the attitude of medical practitioners all over the country does not differ very much from the samples I have just quoted. Out-

side of the pediatrists and a few internists, prophylaxis, in private practice, is in its infancy. If practicing physicians do not wish to have governmental agencies take over more and more of their work, they must seize the opportunity to do preventive work in their private practice. My purpose is to tell you how this can be done. The value of preventive medicine varies inversely in proportion to the age group, the younger the child the more valuable the prophylactic efforts. It is good pediatric practice to have the infants brought in for an examination and advice once a month for the first ten months of life, then every two or three months until the child is two years of age, twice a year until the child is five, and thereafter for annual visits.

During the first months of life our principal function is to direct the feeding and nutrition of the infant. The baby should be weighed each time and we should expect an average gain of 5 ounces a week for the first six months of life and 4 ounces for the second six months. The mother should be encouraged to nurse her baby. It has become rather fashionable of late years to decry the importance of breast feeding, but while greater advances have been made in artificial feeding, in the great majority of cases there is no food to equal nature's own. After the first three months of life an expert pediatrist can do almost as well with artificial food but it must always be borne in mind that breast feeding, whether expertly directed or not directed at all, is equally good feeding while the value of artificial feeding depends entirely on the expertness of its direction.

The best mortality statistics on breast fed and artificially fed infants are those made by Woodbury[4] on 22,000 live born infants in eight American cities. His summary is as follows:

"The analysis has shown that artificial feeding, as actually practiced in typical city populations, is associated with a mortality between three and four times as high as the mortality among breast fed infants. This excess mortality is not to be explained by the slight overweighing of the group of artificially fed infants in certain groups characterized by high mortality rates; and it appears in all nationalities and in all earning groups."

If the amount of mother's milk is becoming inadequate it can be increased by nursing the baby oftener, by nursing on both breasts each time, and above all by completely emptying the breasts after each nursing. This last can be accomplished by employing a hand pump, water or electrical pump, or by teaching the mother manual expression. If, in spite of these efforts, there is insufficient milk, artificial food should be given after each nursing rather than to replace a nursing. When artificial food becomes necessary, simple dilutions of boiled milk with carbohydrate additions, or evaporated milk dilutions may be used. Only in exceptional cases is it necessary to employ more complicated formulæ. In the first six months of life the baby requires, on an average, 45 calories for each pound of body weight in twenty-four hours. In terms of both breast milk and cow's milk this means two ounces for each pound of weight.

To prevent scurvy, the baby should be given early one teaspoon of orange juice to be gradually increased to three ounces a day. Antirachitics should be employed from the second week of life. Two teaspoons of a potent cod-liver oil daily is sufficient to prevent rickets in the majority of cases, though with increasing war shortages it may be advantageous to employ concentrated substitutes such as viosterol and oleum percomorphum. The infant should be examined monthly for signs of rickets or anemia; this is especially necessary in prematures. A large proportion of infants exhibit early evidences of a sensitive skin. Such infants should be protected from all external irritants such as woolen underclothing, cold, soap and hard water. Appropriate lotions and ointments may be used to prevent the appearance of eczema. When eczema persists, it may be necessary to employ an elimination diet. From the fourth to the twelfth month vegetables, cereals, cooked fruits, and egg yolk may be added to the diet, and by the tenth month the infant may be placed on three meals a day.

During the latter half of the first year the infant should be immunized against various diseases. Sauer's pertussis vaccine may be given any time after six months of age. When exposed to whooping cough 10 per cent of infants who have been given this vaccine may contract a mild pertussis as against 75 per cent of those nonimmunized. Such results warrant us in advising these immunizations though it must be made clear that the results cannot be guaranteed. The three-dose diphtheria toxoid should be administered at eight months of age to be followed in

four months by the Schick test. Tetanus immunization may be employed for any child but it is of especial benefit to allergic children since they are likely to be more sensitive to horse serum.

Vaccination against smallpox should be performed before the end of the first year. The reactions of the infant to all these procedures is exceedingly mild; much milder than in older children and adults. Typhoid and scarlet fever immunizations may be done later if special circumstances warrant.

From the second to the fifth year infection plays an increasingly important role in the child's life. It has been said that the greatest unsolved problem of pediatrics is how to prevent recurring and chronic upper respiratory infections. Ultraviolet radiation and large doses of Vitamin A have been recommended but they are only mildly effective. So-called "cold" vaccines may be administered but only when all other methods have failed. Our principal weapon remains, the removal of foci of infection. In childhood such foci are limited almost entirely to tonsils, adenoids, and accessory nasal sinuses. The deciduous teeth are frequently a source of local infection but very seldom of focal infection. The question of when to remove tonsils and adenoids and when to invade sinuses has caused more controversy than perhaps any other medical and surgical procedure. The indications for tonsillectomy and adenoidectomy are: (1) obstruction to breathing; (2) repeated or chronic infections of the upper respiratory tract; and (3) infection in remote parts of the body which probably originate from a focus in the nose and throat. Such infections are: otitis media, recurrent or chronic bronchitis, rheumatism, infectious asthma and nephritis.

The relation of focal infection to systemic disease is no more clear cut than in otitis media. Drainage of the maxillary sinuses is the operation of choice for recurring otitis media and even in subacute and chronic otitis media. It has been a surprise to me how frequently drainage of sinuses has relieved a more or less chronic otitis media and made a mastoid operation unnecessary. If there is no emergency involved I always insist on a sinus drainage before a mastoidectomy is permitted. From personal experience over a period of years I recommend this procedure very highly even though it has received little consideration in medical literature. Even if mastoidectomy is necessary after sinus drainage, the removal of foci of infection will help prevent further mastoid disease, which is quite possible after a mastoidectomy.

The relation of foci of infection to the rheumatic syndrome has been an important controversy for years. Infections of the nose and throat are probably not the true cause of rheumatism but are frequently the immediate exciting cause. When such is the case the tonsils and adenoids should be removed and if this brings no relief, sinus drainage should seriously be considered. Kaiser of Rochester has written many papers to show that tonsillectomy does not prevent rheumatism and probably does little to alleviate it after it has begun. I accept his work as sound but feel that only part of the problem has been attacked because the sinuses have been completely ignored. In Kaiser's work, and in similar statistical studies, the answers are all recorded as definite success or failure. In my experience removal of foci of infection markedly alleviates the rheumatic condition. But in a statistical study such cases are recorded as failures if even mild rheumatic attacks recur. The relation of infection to rheumatism is nowhere more completely demonstrated than in the successful prophylactic use of sulfanilamide in these cases. It would therefore seem logical to supplement such prophylactic therapy by the removal of foci of infection. This is another important field where the sinuses have been largely overlooked as a source of infection.

In recurring bronchitis, chronic bronchitis, and bronchiectasis the sinuses are an important source of infection. It is especially in these cases that allergy must be ruled out and this is not an easy thing to do. The seriousness of chronic bronchitis and early bronchiectasis is so great that the patient should usually be given the benefit of any doubt and the tonsils and adenoids removed but even more important the maxillary sinuses should be drained.

Acute glomerular nephritis in childhood is practically always secondary to an acute infection elsewhere. Fortunately the prognosis is usually good, but in most cases it is sound practice to remove the tonsils and adenoids and if indicated drain the sinuses after the disease has subsided, to prevent recurrence. Occasionally where convalescence is unduly prolonged focal infection removal might be indicated while the disease is still active.

Sinus disease must be considered as a possible

factor in such diverse conditions as certain types of pyuria, which recur only in connection with upper respiratory infection; children who have convulsions with each recurring bout of fever; cases of abdominal pain which simulate appendicitis but which on careful observation can be shown to be due to upper respiratory infection; and in a few cases of asthma where infection is the exciting cause.

The best judge of the indications for a tonsillectomy is not necessarily a nose and throat specialist, but rather the physician who has been seeing the child at regular intervals during his respiratory infections and one who is capable of making a complete physical examination. The expert examination of the nose and throat is of less importance. The sanest views on the tonsil problem are contained in an article on the "Indications for Tonsillectomy" by L. W. Dean.[2] Among other things he says:

"Rules cannot be made to determine when tonsils should be removed, the good judgment of the physician must decide in each case just what should be done. He must take into consideration the local conditions, the condition of neighboring structures, and the general condition of the patient. The tonsils play a much more important role as a source of infection in children than in adults."

If the removal of the tonsils does not solve the problem there are other foci of infection remaining, most often in the maxillary sinuses. The point I wish to emphasize is that the physician, be he pediatrist or general practitioner, who examines the child regularly and not just when he has acute infections is in a better position to make a sane, sound judgment regarding the removal of focal infection than the experts who see the patient only once or twice and form their opinion solely from the local nose and throat viewpoint.

Finally, periodic examinations must concern themselves with the emotional side of the child's life, which is undoubtedly fully as important to his future happiness as his physical health. I would like to emphasize that the child must be shown enough love by his parents to acquire a feeling of security but not so much love and sympathy that he leans on it too heavily and is afraid to venture into the world where this crutch will be absent. Adler says that such smothering love and overprotection is the principal cause of the inferiority complex. The family physician or pediatrist is in the best position to advise parents about the emotional side of a child's life because the parents naturally consult him and are accustomed to accepting his advice. Thus he may nip the difficulties in the bud by inducing the parents to change their attitude or when this is impossible, by having the child enter a nursery school. This last may sound formidable, but I would stretch the term nursery school to include private homes where a minimum or four or five pre-school children may get together and have supervised and group play. Difficult social adjustments of the future may be prevented by exposing the child to the "give and take" contact with his equals away from the soft shelter of his own home. As great a psychiatrist as Freud was one of the first to appreciate the value of nursery schools in preventing future emotional imbalance.

The common symptoms of poor appetite, sleeplessness, tantrums and fears rest largely on an emotional basis. By correcting in early life the environmental factors which bring about these comparatively mild neuropathic conditions, we may save the child from the delinquency of adolescence and the so-called nervous breakdowns of adult life. It has been said that the emotional pattern of a child's life has been fixed by the time he is five years of age. If this is true (and it is approximately so) then the pediatrist and the family physician can accomplish more in prophylactic mental hygiene than the psychiatrists and their clinics. The famous German pediatrist Czerny recognized this thirty years ago when he published his book "Der Arzt als Erzieher des Kindes" ("The Physician as a Guide to Bringing up Children").

Of the many books on child psychology on the market I wish to recommend two that are noted for their common sense attitude; Thom's "Everyday Problems of the Everyday Child" and Cameron's "The Nervous Child." Last but not least, every physician who deals with children should read Brennemann's[1] "The Menace of Psychiatry," as instructive and entertaining an article as ever appeared in a medical journal. Books on modern psychology and psychiatry have glutted the market for years; Brennemann in this bit of special pleading takes issue with them on a number of important points and pleads for a return to common sense in our dealings with children.

In conclusion, I hope I have pointed out the possibilities of preventive pediatrics in private practice. The effectiveness of this supervision

will depend on the skill, the knowledge, and the experience of the practitioner. If we physicians do not possess sufficient skill, we must acquire it as one of the necessities of modern medicine.

References

1. Brennemann, J.: Menace of psychiatry. Am. Jour. Dis. Child., 42:376, (Aug.) 1931.

2. Dean, L. W.: Tonsils, their function and indications for their removal. Jour. A.M.A., 103:1044, (Oct. 6) 1934.

3. Powers, Grover F.: Developments in pediatrics in the past quarter century. Yale Jour. Biol. and Med., 12:1-22, (Oct.) 1939.

4. Woodbury, Robert M.: Relation between breast and artificial feeding and infant mortality. Am. Jour. Hygiene, 2:668, (Nov.) 1922.

THE DEVELOPMENT OF CLINICAL PATHOLOGY AS A SPECIALTY

ARTHUR H. SANFORD, M.D.

Rochester, Minnesota

DURING the last quarter of a century specialization in medicine has developed in a most remarkable fashion. Among the specialties now recognized is that of clinical pathology. Although a number of laboratory men who would now be considered qualified clinical pathologists were practicing this specialty before 1918 when MINNESOTA MEDICINE came into being, their position in the field was not well established. The specialty as now defined by the American Board of Pathology is that branch of pathology that deals with bacteriology, immunology, biochemistry, parasitology, hematology, and clinical microscopy in relation to the diagnosis, prognosis and treatment of clinical disease. In addition to this, many clinical pathologists include in their daily work the diagnosis of biopsy material or surgical pathology. They may be qualified also as specialists in pathologic anatomy.

In the first volume of MINNESOTA MEDICINE, published in 1918, is a paper on "Absolutely Necessary Microscopic Diagnoses," by W. C. MacCarty, which he read before the meeting of the Minnesota State Medical Association. He emphasized the necessity of adequate training in laboratory fields and that the pathologist should be considered a consultant. Marx White in discussing the paper expressed the belief that the scarcity of whole-time laboratory men was principally and largely due to the inadequate compensation given to such men and the fact that clinicians did not correlate their work with that of laboratory men. This paper is mentioned because of the great impetus to the recognition of clinical pathology as a specialized field that came after the formation of the American Society of Clinical Pathology three years later in 1921. Dr. MacCarty was the second president of this society and there have been two other presidents from the State of Minnesota, Dr. A. H. Sanford in 1927-1928 and Dr. T. B. Magath in 1938-1939. The president in 1939-1940 was Dr. L. W. Larson of Bismarck, North Dakota, an alumnus of the University of Minnesota, School of Medicine. The objectives of this society are the promotion of the practice of scientific medicine by a wider application of clinical laboratory methods to the diagnosis of disease; the stimulation of original research in all branches of clinical laboratory work; the establishment from time to time of standardization for the performance of various laboratory examinations; the elevation of the scientific and professional status of those specializing in this branch of medicine and the encouragement of closer coöperation between the practicing physician and the clinical pathologist. That there has been a measure of realization of these objectives I firmly believe.

A brief description of the progress that has been made in this field during the last quarter of a century may interest the readers of MINNESOTA MEDICINE. I do not believe that I make any overstatement of facts in the contention that much of the progress has been due to the activities of the American Society of Clinical Pathologists. One of its active members, Dr. Warren T. Vaughan, succeeded his father, Dr. Victor C. Vaughan, as editor of the *Journal of Laboratory and Clinical Medicine*. This journal has been in existence two years longer than MINNESOTA MEDICINE and its volumes record the introduction and development of many of the laboratory procedures that have become routine in an up-

From the Division of Clinical Pathology, the Mayo Clinic, Rochester, Minnesota.

to-date clinical laboratory. The American Society of Clinical Pathologists, since 1931, has published the widely read *American Journal of Clinical Pathology*. Dr. Magath was the able editor of this journal for the first six years of its existence. Advances in the field of clinical pathology are not made necessarily by the clinical pathologist but rather are made for him by investigators in the fields of physiology and clinical medicine; however, the actual worth of new procedures finally is tested by their routine use in clinical laboratories and by comparison of the results reported by clinical pathologists.

In the field of hematology the well recognized development is due to the better understanding by both clinicians and clinical pathologists of the methods of cytologic study and the management and treatment of diseases of the blood and blood-forming organs. Through the teachings of Dr. Hal Downey and his colleagues and former students, the careful preparation of blood films and their staining for study have been greatly improved. Innumerable articles on hematology have appeared in all medical journals during the past quarter of a century. Some of the interesting papers on this subject that have appeared in Minnesota Medicine are as follows: In 1927 E. T. F. Richards wrote on "Infectious Mononucleosis"; in this paper he covered his experience during the period back to 1921. In the same volume an editorial on "Glandular Fever (Infectious Mononucleosis)," appeared which contained the statement that the question as to which term is proper is for the hematologist to settle. Six years later, in volume 16, R. C. Logefeil reported a case of "Acute Mononucleosis or Glandular Fever." He stated that the case was reported because this disease was more common than generally recognized; he reëmphasized the importance of careful morphologic study on blood cells when diseases were present which involved any part of the hemopoietic system. This paper was read at one of the early meetings of the Minnesota Society of Internal Medicine. In 1930, in volume 13, C. H. Watkins and F. J. Heck published a paper read at a meeting of the Minnesota State Medical Association on "The Practical Value of Examination of Blood Smears." In volume 14, R. C. Logefeil reported a case of agranulocytic angina and stated that seventy-nine cases of undoubted agranulocytic angina had been reported in the literature at that time. Two years later in volume 16, E. T. F. Richards and Kano Ikeda published a paper on "Agranulocytosis." In volume 23, J. M. Adams and R. F. Cochrane published a paper on "Erythroblastosis (Icterus Gravis) in the Newborn." They recognized the high familial tendency in this disease. However, this was before the rôle of the Rh factor as a possible cause was considered. In volume 22 appeared an editorial on "The Megakaryocyte" with several good references to the literature of 1938. In that editorial reference is made to the statement by Castle that Hodgkin's disease is a megakaryocyte tumor. The whole study of the megakaryocyte was directed toward determining the value of examinations of bone marrow as a clinical laboratory procedure.

In the field of serology, although there has been no real change in the basic methods, a remarkable development in modifications of the complement fixation tests and of the flocculation tests has occurred in the last twenty-five years. In volume 1, J. H. Stokes wrote in an article entitled "Medical Coöperation in the Problem of War Syphilis" as follows: "If the negative Wassermann is destined to yield in some degree to clinical judgment, the positive Wassermann must, in its turn, have a restoration to medical confidence." At that time, the Army serodiagnostic test was based on the Noguchi and Bronfenbrenner antihuman hemolytic system. This was not a particularly sensitive test. In 1922, the Kolmer modification of the Wassermann technique and the careful studies concerning the preparation of various reagents were developed. At the same time, the Kahn flocculation test became a much favored method for the serodiagnosis of syphilis. In volume 10, Margaret Warwick wrote an editorial on "The Kahn Precipitation Test for Syphilis." This was in 1927. She stated, "It may not be too presumptuous to predict that in the not too distant future it may entirely supersede the old Wassermann reaction in the laboratory diagnosis of syphilis." Fifteen years later it is interesting to note in this connection that although this and other flocculation tests are considered extremely valuable, it is not believed that they should supersede the complement fixation test but rather should be used in conjunction with it. Shortly after the development of the Kahn test, Kline described his microscope slide precipitation

test and Hinton developed a highly satisfactory flocculation test requiring overnight incubation in the water bath. This along with the Eagle flocculation test and the Eagle complement fixation test became a standard test in this country after the 1935 evaluation of serodiagnostic tests for syphilis, conducted by a joint committee of the American Society of Clinical Pathologists and the United States Public Health Service.

In the selection of donors for transfusion, there was considerable confusion owing to the numerical designation of the four blood groups. The various societies concerned, including the American Society of Clinical Pathologists, suggested that the letters AB be substituted for group I of the Moss classification, A for group II, B for group III and 0 (zero) for group IV. Fifteen years ago in an editorial in MINNESOTA MEDICINE, I suggested that the reports could be made in such a way that these letters were included in brackets after the numbers. Use of the numbers has ceased, and in the literature and in reports from the laboratory to the clinician, groups are referred to only by the letters AB, A, B and 0. This classification was proposed by Landsteiner, the discoverer of blood groups. The demonstration of M, N and MN groups is of academic interest and also of practical use in medicolegal cases, but by far the most important new investigations on the blood are in relation to the Rh factor. To this factor apparently can be attributed many unexplained reactions after transfusions with blood of the correct group and it also provides a most striking explanation for the cause of erythroblastosis.

In the field of bacteriology the diagnosis of undulant fever by use of agglutination tests and also cultures of blood for the organism has been a development of the past quarter of a century. Recognition of the importance of this disease began to appear in MINNESOTA MEDICINE in volume 12 in an article by F. J. Hirschboeck presented at the meeting of the State Association in 1929. In the same volume R. W. Giere reported a case of Malta fever. He referred to Evans' report in 1928 of sixty-five cases. Also in this same volume, C. O. Kohlbry reported a case of undulant fever of an infant, one year old. In volume 13, E. C. Bayley had an article on the same subject. In volume 14, A. C. Fortney reported four cases. In volume 16 was published the address on "Undulant Fever (Brucelliasis)" which Walter M. Simpson read before the meeting of the State Association in 1933. At that time he stated that during the past five years undulant fever had evolved from the obscurity of a clinical curiosity to the prominence of a permanent public health problem. Eight years later in volume 24, another address by Simpson on the same subject appeared; it also was presented before a meeting of the State Association. In the same volume, I. Fisher published a paper on "Brucellosis."

During the same period, tularemia became recognized as an important disease and its diagnosis is made in a similar manner by agglutination test and by culture. An editorial by Margaret Warwick in volume 11, 1928, brought attention to Simpson's report of the appearance of tularemia in Dayton, Ohio. In volume 16, in 1933, H. R. Hartman, D. C. Beaver and F. G. Green reported on "The Occurrence of Tularemia in Minnesota in 1921: Report of Two Cases—One Fatal with a Necropsy Report." E. C. Hanson and R. G. Green also had reported on "Tularemia in Minnesota" in the *Journal of the American Medical Association* for June 8, 1929. By 1932 the number of cases in the State Department of Health of Minnesota made it evident that tularemia had become of epidemiologic significance in Minnesota. Probably the first case in Minnesota was reported in MINNESOTA MEDICINE in 1927 by L. H. Rutledge from Becker County.

Another disease which is diagnosed chiefly by an agglutination test is that of Rocky Mountain spotted fever. An editorial in volume 15 in 1932 brought attention to the appearance of this disease in Minnesota and to the use of the Weil-Felix reaction for confirmation. In 1936, H. A. Reimann published an article in volume 19 on "Rocky Mountain Spotted Fever in Minnesota: Report of the Second Indigenous Case and Biologic Studies." He emphasized that biologic and bacteriologic tests were necessary for diagnosis.

It is impossible to mention in detail all of the various improvements in technical procedures for the culture of organisms, both aerobic and anaerobic, that have been developed in the last quarter of a century. The preparation of media of all sorts has been greatly simplified by the accurate preparation of media and the marketing of them in a dehydrated state. Numerous modifica-

tions of culture media have increased the reliability of differential diagnoses in the field of bacteriology as performed in the clinical laboratory. The demonstration of acid-fast bacilli stained with auramine O by fluorescence microscopy is perhaps the most recent development in the examination of sputum and other materials for *Mycobacterium tuberculosis.* Within the last few years there has been an increasing interest in histoplasmosis, caused by *Histoplasma capsulatum,* now known to be a fungus disease. Torula meningitis, caused by an organism classified by Todd and Herman and confirmed by A. T. Henrici as *Debaryomyces neoformans,* is receiving an increasing amount of attention in clinical laboratories. The same may be said for infections with *Coccidioides immitis.*

Parasitology, as a special field in zoölogy, requires highly specialized training and has a history which is older than that of bacteriology, as many protozoal parasites were discovered before pathogenic bacteria were known. During the past twenty-five years, parasitology has been of continued and increasing interest in the clinical laboratory. Minnesota Medicine has contributed its share to the literature of importance in this field. In volume 10 an editorial on "Infected Fish" referred to an article in the same volume by T. B. Magath on "Experimental Studies on *Diphyllobothrium latum.*" This was a preliminary report. In the next volume, R. O. Christenson and W. P. Greene reported "Studies on Biological and Medical Aspects of 'Swimmer's' Itch." This was the first report of schistosome dermatitis in Minnesota. In volume 12, W. A. Riley had a paper on "The Importance of Stained Preparations in the Study of Amebic Infections." In the same volume P. W. Brown published a paper on "The More Common Intestinal Parasites of the Northwest." This subject had been presented from the Mayo Clinic fifteen years or more before this report. R. L. Wilder and F. C. Rodda in this same volume presented an article on "*Diphyllobothrium latum* (Fish Tapeworm) Infestation in Children: Report of Two Cases." In volume 14, R. J. Moe and W. A. Coventry published a paper on "Trichomonas Vaginalis Vaginitis," in which they reported ninety-five cases of their own. They stated that the frequent occurrence of *Trichomonas vaginalis* had activated an interest which had then reached its peak. This organism was discovered by Donné in 1836. In volume 15, E. D. Plass published a paper on "Recent Advances in the Study of the Cause and Treatment of Leukorrhea." *Trichomonas vaginalis* was emphasized as a probable cause. An editorial appeared in volume 16 on "Amebiasis and a Century of Progress." The editor concluded that it seemed evident that amebiasis was not being diagnosed generally. In volume 17, J. N. Gehlen reported a case of amebiasis complicated by abscesses of the liver, lungs and brain. In volume 18, P. W. Brown and T. B. Magath had an article on "Amebiasis: Diagnosis, Prevention and Treatment."

Perhaps the greatest advances in laboratory medicine have been made in the field of blood chemistry. As physiologists and research workers have proved the reliability and diagnostic worth of new procedures in physiologic chemistry, the clinician turns to the clinical chemical laboratory for these aids to routine diagnoses. Much of this work originated about twenty to twenty-five years ago. In 1923, Moses Barron published in Minnesota Medicine a paper that was read in October, 1922, at the state meeting on "The Value and Importance of Blood Chemistry in Clinical Medicine." At this time he especially emphasized the blood sugar test, the urea determination, creatinine determination and uric acid determination. Since that time there have been numerous changes in technique. New methods have been devised for the determination of amino acid nitrogen in blood. Sullivan's work on the determination of cysteine and cystine has become the standard. The methods of determining the concentration of cholesterol and cholesterol esters in the blood are practically the same as those of a quarter of a century ago, although changes have been made in the technique for determinations of phospholipid. New methods have been devised for the determination of blood chlorides and the sugar tolerance test has been partially supplanted by the one-hour, two-dose tolerance test of Exton and Rose, brought out in 1934. There have been recent modifications in the methods of determining calcium, phosphorus and phosphatase. The method for the determination of iron in the blood was developed about fifteen years ago. This method and also the Van Slyke oxygen capacity method have been considered standard methods for the quantitative determination of hemoglobin; however, the most recent method for determination of hemoglobin is the photelometric

method used now for about twelve years. The photelometer also has been used for a number of other chemical determinations and a number of similar photo-electric colorimeters are now in use.

As a test of renal function, the urea clearance test was devised about twenty years ago. Recently considerable attention has been paid to the study of clearance of other substances besides urea, such as inulin and diodrast. Sulfate and sulfate clearances have attracted attention. Determinations of sodium and potassium in the blood and urine have become clinical laboratory procedures. Great interest has been directed toward the quantitative estimation of bile pigment in the blood serum and toward the development of various tests of liver function. The Rosenthal bromsulfalein test and Delprat's rose bengal test came into general use about seventeen or eighteen years ago. The galactose tolerance test has been in use for more than ten years. More recently Quick's hippuric acid test has been developed. The Quick prothrombin time test which is used chiefly as a test for the study of coagulation factors also may be used as a test of liver function after the administration of Vitamin K. The use of sulfanilamide and sulfonamide drugs now has brought about the determination of these substances in the blood and urine as a clinical laboratory procedure. I might mention many more substances for which quantitative determinations must be made in clinical investigation. The research of today becomes the routine of tomorrow in this ever-expanding field of laboratory medicine.

In connection with clinical pathology the vocation of medical technology for well-trained women has developed. Twenty years ago in volume 6, W. E. King presented a paper on "The Training of the Laboratory Technician." In the same volume of Minnesota Medicine, Kano Ikeda presented a paper on "Standardization of Clinical Laboratories and Technicians." In the discussion of this paper R. O. Beard outlined the proposed plan for the University of Minnesota, School of Medical Technology. This was started twenty years ago. In 1923 there were two graduates. From that time through June, 1942, there have been 471 graduates. In volume 17, 1934, of Minnesota Medicine, Ikeda, as secretary of the Board of Registry of Technicians of the American Society of Clinical Pathologists, published an article on "Laboratory Technicians." He stated, "Today it is generally accepted that the particularly technical or mechanical part may be invested wisely in the hands of trained medical assistants, whose duty it shall be to devote their skill and energy in the performance of the various technical methods demanded of the laboratory." The Board of Registry was established fourteen years ago in 1928. Standards for the training have been well laid down by the American Society of Clinical Pathologists and the American Medical Association. A minimum of two years of college work with training in basic sciences plus at least twelve months of intensive training in a hospital laboratory training school is required before the technician is eligible for examination for registration. There are now many thousands of registered technicians and up to the present the supply does not meet the demand. Commercial schools have been set up which pretend to give adequate training; these advertise in lay journals but offer little for the high tuition charged. However, the standard for recognized hospital laboratory training schools has been kept high by the American Society of Clinical Pathologists and the American Medical Association, so that for the most part technicians are really well trained.

Reference has been made to the American Board of Pathology and its definition of clinical pathology as a specialty in medicine. In June, 1935, the Section on Pathology and Physiology of the American Medical Association and the American Society of Clinical Pathologists appointed committees which acted jointly in consideration of the formation of an American Board of Pathology. The Board was organized July 19, 1936. There was an immediate response on the part of pathologists all over the country for certification by this Board as to their qualifications either as specialists in pathologic anatomy or clinical pathology or both. Up to the time of the preparation of the 1942 edition of the *Directory of Medical Specialists,* certified by the various American Boards, more than 800 specialists had been certified by the American Board of Pathology. Since that time more than 150 more candidates have either passed the examination or have applied for examination. Of the number whose names appear in the Directory, 148 are certified in pathologic anatomy alone, ninety-one are certified as clinical pathologists

alone, while 566 are certified in both pathologic anatomy and clinical pathology. In other words, in this 1942 Directory more than 650 specialists are listed who are qualified in the field of clinical pathology. As would be expected, these are distributed according to population. The most populous states of California, Illinois, New York and Pennsylvania have the largest number that are certified. In New York State there are more than 100 qualified clinical pathologists, in Pennsylvania more than seventy, in California about fifty and in Illinois nearly forty. Minnesota has five specialists that are certified in clinical pathology alone and ten in both clinical pathology and pathologic anatomy. Seven men are certified in both clinical pathology and pathological anatomy in the Provinces of Canada, three in Hawaii, three in Puerto Rico, one in the Canal Zone and one in the Philippine Islands.

Minnesota Medicine appeared at a time when the country was making every effort toward winning the World War of 1914-1918, and now at the time of the publication of the Twenty-fifth Anniversary number the medical profession and the entire nation are discussing many of the same problems. It became evident when physicians were called to service that there was a shortage of clinical pathologists both for military service and for the civilian population. While from necessity training in specialties for many recent graduates must be deferred for the time being and while it is not proper nor safe to make too sweeping predictions about the future, it is fair to assume that this specialty will continue to attract young men who are interested in laboratory medicine and scientific methods for diagnosis, and that the next quarter of a century will see proportionately greater strides in all fields of medicine and particularly in the use of the laboratory.

TWENTY-FIVE YEARS OF "MINNESOTA MEDICINE" AND OF ANESTHESIOLOGY

JOHN S. LUNDY, M.D.
Rochester, Minnesota

THE journal, Minnesota Medicine, is twenty-five years old. Within that period, the specialty of anesthesiology has greatly developed. The state of Minnesota has contributed its share in this development and Minnesota Medicine has done its part. I shall emphasize Minnesota contributions but, obviously, it would be impracticable to confine this review to achievements in any one state.

Local and Spinal Anesthesia

From an historical point of view, the late R. E. Farr, of Minneapolis, comes to mind in regard both to Minnesota Medicine and anesthesiology. He was instrumental in bringing Minnesota Medicine into existence and anesthesia, especially local anesthesia, was a primary interest among his many activities. In 1923 he published his textbook on local anesthesia.[3] This had a salutary effect on local anesthesia throughout the country and was a potent factor in arousing interest in the use of local anesthesia.

To begin at the beginning of the story, however, it should be said that, prior to the time of publication of Farr's book, attempts to interest people in local and spinal anesthesia had been made in Minnesota. As early as December, 1909, Thomas Jonnesco[9] anesthetized three patients at the Rochester State Hospital, using spinal anesthesia. In one case amputation of the forearm was performed and Jonnesco wrote, "In this case analgesia was perfect. The patient was conscious and had no ill effects whatever, either during or after the operation." W. C. MacCarty, who saw the demonstration, has said that stovaine was the the agent used. However, it was not until 1920, when C. H. Mayo brought Gaston Labat from Paris to Rochester for a period of ten months, that local, regional, and spinal anesthesia were given real trials in Rochester. Gaston Labat's textbook, "Regional Anesthesia; Its Technique and Clinical Application" (1922)[7] did a great deal toward more general acceptance of regional methods of anesthesia. After Labat's departure, William R. Meeker continued Labat's work for a lit-

From the Section on Anesthesia, The Mayo Clinic, Rochester, Minnesota.

tle more than two years. In the latter part of 1923 the work was carried on by various fellows in surgery of the Mayo Foundation. The one who kept the fires burning was W. H. Sprunt. He was active in this capacity for the first half of 1924 and introduced me to the various procedures then in use in regional and local anesthesia. Interestingly, spinal anesthesia was used in Rochester but once that year and was not used in 1925 or 1926.

Since that time spinal anesthesia has become more and more widely used. Various local anesthetic drugs have been introduced, such as nupercaine, pontocaine and metycaine. The problem had been how to give a safe dose and at the same time produce anesthesia that would last for a long enough period. This problem was finally solved by W. T. Lemmon[8] of Philadelphia, in 1940, when he presented his method of continuous spinal anesthesia. This is a very valuable contribution and demonstrates how a new method can increase the usefulness of an old agent such as procaine. R. A. Hingson, of the United States Public Health Service, had training in anesthesia in the Mayo Foundation in Rochester, in 1940-1941. In 1941, shortly after he left Minnesota, he developed, in conjunction with W. B. Edwards,[2] a method of continuous caudal anesthesia in obstetrics. This method is full of promise, as it can be used for labor as well as for delivery. It demonstrates the different origins of the sensory and motor innervation of the uterus and is the newest method in anesthesia at the present time.

Anesthesia by Inhalation

Some pioneer work in inhalation anesthesia was done in Minnesota. For example, the open drop method of administering ether was brought to a high state of development in Rochester by nurse anesthetists[15] under the supervision of A. W. Stinchfield and Isabella Herb.

Chloroform has not been in favor in institutional practice in Minnesota during the last twenty-five years. However, it has been used to some extent in rural practice, especially for obstetrics. Administration of chloroform occasionally is associated with sudden cardiac failure; in some cases there is delayed central necrosis of hepatic lobules, with fatal issue. From time to time it has been suggested that this drug be administered with oxygen in order to avoid the hepatic damage. This technique has not been perfected, however, although some day it may be. It is said that sulfanilamide, as well as xanthine, prevents hepatic damage from chloroform. I have not used chloroform since 1927.

The story of gas anesthesia in Minnesota begins at least as early as 1900, in so far as surgical cases are concerned. It was first used in Rochester on November 25, 1900, and in a few cases that month and the next. It was not used again in Rochester until October, 1918, when the dental surgeon, Boyd S. Gardner, employed nitrous oxide and oxygen for dental extraction. It has been in continuous use in Rochester since that time. In Minneapolis, J. A. Heidbrink had been using gas anesthesia for some time. In 1910 he developed the technique of "timed anesthesia," in which nitrous oxide and oxygen, instead of nitrous oxide and somnoform were used. He used reducing valves as flow meters. In the following years, in association with B. J. Clark, Heidbrink developed the gas machine that bears his name. The machine was for use not only in dental surgery but in general surgery, and Heidbrink's machine and technique became used throughout the world. About this same time, Connell, McKesson, Forregger and others began the manufacture of gas machines. In 1918, Luckhardt and Thompson were experimenting with ethylene as an anesthetic agent and it came into clinical use in March, 1923. It was brought to Minnesota and used in Rochester in May, 1923.

In 1925, Ralph M. Waters introduced the soda lime absorption method of gas anesthesia; a method which made possible clinical introduction of the gas, cyclopropane, by Waters, Neff and Rovenstine in 1933. This was a great advance in gas anesthesia and there has been no marked advance along that line since that time except for the work of Woodbridge and Tovell in studying measures to minimize the explosive hazard of anesthetic mixtures.

Divinyl ether was suggested by C. D. Leake,[6] now of Texas, in 1930 and was recommended for clinical use by Goldschmidt, Ravdin, and associates,[4] in 1933. Divinyl ether has proved to be a useful anesthetic agent for short, minor operations.

Rectal Anesthesia

Rectal anesthesia was developed in a practical way by Gwathmey, in 1913, and in his book,

"Anesthesia," published in 1914, considerable space was devoted to the use of ether and oil by rectum. The method became well known and was used extensively, especially in obstetrics, until tribromethyl alcohol was introduced and became generally accepted in 1926. The rectal method of anesthesia is accepted less as the sole method of anesthesia than as a means of production of basal narcosis, to be supplemented by other methods such as local, inhalation, or intravenous anesthesia. However, it is useful in certain situations; especially when a patient has to be treated in a dark room under roentgenoscopic control. The development of rectal anesthesia took place very largely in the last twenty-five years.

Intravenous Anesthesia

Intravenous anesthesia, which was first used by Ore, of France, in 1872, when he injected chloral hydrate intravenously, did not become widely used for many years, although a number of agents were tried. The story of this development will appear in R. C. Adams' forthcoming book on intravenous anesthesia. It was not until 1929, when Zerfas[14] reported on the use of sodium amytal, given intravenously, that the modern trend toward the use of intravenous anesthesia developed. I made one of the early reports on the use of sodium amytal in Minnesota, in 1930,[10] and the following year I made a report on the use of sodium nembutal (pentobarbital sodium)[11] as an anesthetic agent for intravenous use. These drugs were not satisfactory; therefore, the method did not become generally accepted. In 1932, Weese and Scharpff[18] introduced evipan, now called evipal, and great interest was aroused in the intravenous method. In 1935 I reported the use of pentothal sodium for intravenous anesthesia[12] and, since that time the method has become widely adopted because the agent has been relatively satisfactory; however, in further investigations better agents may be developed.

Endotracheal Anesthesia

One of the great advances in anesthesia was made by I. W. Magill, of England, in 1920, when he modernized endotracheal anesthesia. In 1928, in Winnipeg, at a joint meeting of the British and Canadian Medical Societies, he read a paper on endotracheal anesthesia and presented an intratracheal tube of large bore and made of relatively soft rubber. He visited me in Rochester and left with me his equipment, including laryngoscope, connectors and tubes. I persuaded the Heidbrink Company of Minneapolis to manufacture the Magill rubber intratracheal tubes. Of course, competitors followed their example and shortly the tubes were generally available and were widely used, to the great advantage of patients, surgeons and anesthetists. The endotracheal method is one of the most valuable techniques in all of anesthesia.

Research

The foregoing is evidence that clinical anesthesia has made much progress in the last twenty-five years. A good deal of research also has been carried on in this field, not only in laboratories of chemistry but also in laboratories of physiology, pharmacology and anatomy. Unfortunately it cannot be assumed that the human being will react exactly as the laboratory animal does to various agents and methods. Still, in general the effects are similar and progress in clinical anesthesia is in a large part dependent on further knowledge obtained from laboratory experiments. This is true also in fields allied to anesthesia, which have come to be included in the field of anesthesiology. Oxygen therapy, transfusion of blood,[16,17] treatment of shock and use of supportive measures, including administration of stimulants, have seen their greatest development in the last twenty-five years. The extensive use of refrigeration has made possible so-called blood banks. The development of processes for drying plasma and for solidly freezing it have added to the scope of use of this material; thus medical practice has been improved, many lives have been saved and plasma will be of the greatest value in the present war.

Publications, Organizations and Minnesota's Educational Efforts

From the standpoint of publications and development of organizations of anesthetists, most such progress has occurred in the last twenty-five years. In 1920, Crile and Lower[1] published their book on anesthesia. Labat's book has been previously mentioned. Publication of the magazine, *Current Researches in Anesthesia and Analgesia,* began in 1922. In the same year, in England, occurred the first meeting of the Section on Anes-

thesia of the British Medical Association. In 1923, the *British Journal of Anesthesia* was issued for the first time. In 1927, the first meeting of the Section on Anesthesia of the Canadian Medical Association was held. In Germany, in 1928, was begun the publication of *Narkose und Anæsthesie* and, in 1929, the publication *Schmerz* was united with the former. The year 1933 saw the first publication of the *Bulletin of the National Association of Nurse Anesthetists.* In Italy in 1935, the *Giornale Italiano di Anestesia e di Analgesia* was first published, and the same year, in France, saw inauguration of the new journal *Anesthésie et Analgésie.* In 1937, the American Board of Anesthesiology, Incorporated, was formed. In the same year Guedel published his book "Inhalation Anesthesia." It was also in 1937 that, in Minnesota, "Anesthesia Abstracts" first appeared. In 1938, Beecher published his "Physiology of Anesthesia." In Argentina, in 1939, publication of the journal *Revista Argentina de Anestesia y Analgesia* was begun. Publication of the journal, *Anesthesiology,* was started in 1940 and, in the following year, the first meeting of the Section on Anesthesiology of the American Medical Association was held. "Fundamentals of Anesthesia" was prepared by the Subcommittee on Anesthesia of the National Research Council and was published by the American Medical Association in 1941. "Endotracheal Anesthesia" by Noel A. Gillespie was published in 1941 and "Clinical Anesthesia," a book written by myself,[13] was published in 1942.

In education, Minnesota has taken a leading position. Since 1920, Ralph T. Knight has been in charge of anesthesia at the University of Minnesota and he has taught, and stimulated interest in the subject in the medical school of the university. He has organized the practice of anesthesia in the University of Minnesota Hospitals and in the Minneapolis General Hospital. He acts as a consultant in anesthesia to other hospitals in the Twin Cities. He has stimulated the interest of many individuals in anesthesia and has contributed to the progress of the specialty in many ways. In March, 1923, the University of Minnesota established a fellowship in anesthesia leading to the degree of Master of Science in Anesthesiology. The first person to receive this degree was E. B. Tuohy (1936). Since that time ten have received the degree.

The Immediate Future and the Anesthesiologist's Debt to "Minnesota Medicine"

In the present war, the armed forces are making every effort to train and employ as many physician anesthetists as possible. This will increase the ranks of anesthetists considerably and it would be reasonable to suppose that, after the war is over, and those men return to civilian practice, the specialty of anesthesia will receive the same impetus that thoracic surgery received after the war of 1914-1918. With respect to its past progress and future prospects, the specialty of anesthesia owes a debt of gratitude to MINNESOTA MEDICINE for the many papers on anesthesia and allied subjects which it has published. I can fittingly close this necessarily incomplete review by wishing for MINNESOTA MEDICINE a long and successful existence. This I believe to be the desire of all Minnesota physicians and many others elsewhere.

References

1. Crile, G. W., and Lower, W. E.: Anoci-association. Philadelphia: W. B. Saunders Company, 1914.
2. Edwards, W. B., and Hingson, R. A.: Continuous caudal anesthesia in obstetrics. Am. Jour. Surg., 57:459-464, (Sept.) 1942.
3. Farr, R. E.: Practical local anesthesia. Philadelphia: Lea & Febiger, 1923.
4. Goldschmidt, Samuel, Ravdin, I. S., Lucke, Baldwin, Muller, G. P., Johnston, C. G., and Ruigh, W. L.: Divinyl ether: experimental and clinical studies. Jour. A.M.A., 102:21-27, (Jan.) 1934.
5. Gwathmey, J. T.: Obstetrical analgesia: a further study based on more than 20,000 cases. Anesth. and Analg., 10:256-262, (Nov.-Dec.) 1931.
6. Knoefel, P. K., Guedel, E. A., and Leake, C. D.: Experimental observations on the anesthetic properties of divinyl ether. Proc. Soc. Exper. Biol. and Med., 29:139-140, (Nov.) 1931.
7. Labat, Gaston: Regional anesthesia. Philadelphia: W. B. Saunders Company, 1922.
8. Lemmon, W. T.: Method for continuous spinal anesthesia; preliminary report. Ann. Surg., 111:141-144, (Jan.) 1940.
9. Letters to the editor: Remark on general spinal anesthesia. New York Med. Jour., 91:43-44, (Jan. 1) 1910.
10. Lundy, J. S.: Intravenous anesthesia; particularly hypnotic, anesthetic and toxic effects of certain new derivatives of barbituric acid. Anesth. and Analg., 9:210-217, (Sept.-Oct.) 1930.
11. Lundy, J. S.: Experience with sodium ethyl (1-methylbutyl) barbiturate (nembutal) in more than 2,300 cases. Surg. Clin. North America, 11:909-915, (Aug.) 1931.
12. Lundy, J. S.: Intravenous anesthesia: preliminary report of the use of two new thiobarbiturates. Proc. Staff Meet., Mayo Clin., 10:536-543, (Aug.) 1935.
13. Lundy, J. S.: Clinical anesthesia. Philadelphia: W. B. Saunders Company, 1942.
14. McCallum, J. T. C., and Zerfas, L. G.: Sodium iso-amyl-ethyl barbiturate. Am. Jour. Surg., 8:39-43, (Jan.) 1930.
15. Magaw, Alice: A review of over fourteen thousand surgical anesthesias. Surg., Gynec. and Obst., 3:795-799, (Dec.) 1906.
16. Pemberton, J. deJ.: Blood transfusion. Surg., Gynec. and Obst., 28:262-276, (Mar.) 1919.
17. Tuohy, E. B., and Lundy, J. S.: Intravenous administration of blood and other substances for surgical purposes. Surg. Clin. North America, 20:1093-1106, (Aug.) 1940.
18. Weese, H.: Pharmakologie des intravenösen Kurznarkotikums Evipan-Natrium. Deutsche med. Wchnschr., 1:47-48, (Jan.) 1933.

ABDOMINAL PAIN

ARNOLD SCHWYZER, M.D.
Saint Paul, Minnesota

OUR understanding of the pathways of the conduction of abdominal pain has been cleared up only during more recent years. That the parietal peritoneum is very sensitive was well known, but what about the intra-abdominal organs? In 1898 Jaboulay made the attempt to relieve pelvic pain by attacking the sacral sympathetic chain through an approach from behind the rectum. This did not bring distinct results. Fontaine and Hermann of Strasbourg (1932) gave a good historic picture of the development of the surgical measures on the pelvic sympathetic nerves in gynecology where they mention that Ruggi, about a year after Jaboulay, published his "work on abdominal sympathectomy in functional disturbances of the female genital organs." He advised the resection of the utero-ovarian plexus by the transperitoneal route. For a long time gynecologists had examined closely the distributions of the pelvic sympathetic nerves. Lee of England (1849) and Frankenhaeuser of Zurich (1867) had studied the nerves of the uterus.

Then came Lennander, the surgeon of Upsala, in 1906 with his epoch-making observations on the perception of pain in the abdominal organs. Though we now know that they are but partially correct, his findings stimulated the study of this subject. He told us that all of the organs which were only supplied by the sympathetic or the vagus below the branching off of the recurrent laryngeal nerve had none of the four kinds of sensation, namely pain, pressure, heat and cold perception. This he demonstrated convincingly concerning bone substance, bone marrow, cartilage, thyroid, lung, stomach, intestine, mesenteries, omentum, gall bladder, liver, pancreas, spleen, the serosa of the urinary bladder, also the kidney parenchyma after the renal fat is completely removed from the fibrous capsule. On the other hand he found perception of pain on the periosteum, the joint capsules, the parietal pleura and the parietal peritoneum. Concerning these two large body cavities, pleura and peritoneum, he stated that what hurt most was a displacement of their delicate lining membranes over the underlying tissues. The nerves which run in the subserosa and which are irritated by pulling on them are of somatic origin, branches of the intercostal, lumbar, and sacral nerves. Lennander's positive observations were of greatest practical importance for the abdominal surgeon who in those days liked to operate where possible under local anesthesia. Lennander did not know of the pain-conducting fibres in the sympathetic, which gynecologists had recognized. The important thing which resulted from Lennander's research is the fact that apart from the pelvic organs and perhaps some portions of the splanchnic nerve along the deeper biliary channels his observations hold good in most of the work which the surgeon is called upon to do in the abdomen.

Mackenzie and Head made valuable contributions in developing the conception of so-called segmental referred pain. Mackenzie's law states that "when a painful stimulus is applied to a part of low sensibility in close central connection with a part of much greater sensibility, the pain produced is felt in the part of high sensibility rather than in the part of lower sensibility to which the stimulus was actually applied." As I understand these authors, visceral and somatic receptor centers are closely associated and through a visceral stimulus an irritated state occurs in this central area which causes a lowered threshold of sensation. As a consequence normal painless stimuli from the body surface which are always present are felt as pain, which is referred to the corresponding surface district.

So much for a short orientation in referred pain. This paper is written from the standpoint of the practitioner as a clinical talk. Operating under local anesthesia has allowed us to verify Lennander's statements time and again. Their value lies in the observation that large areas have no sensation. When an abdominal operation is done under local anesthesia it is most important to avoid pulling on the intestines as the posterior mesenteric attachment is keenly sensitive. The segmental referred pain transmitted through the autonomic system plays a minor role *in praxi* compared with local tenderness which travels through somatic channels. Referred pain may

mislead the surgeon if he is not constantly aware of its possible abnormal localization. The pain may be very severe. It is seldom as definite and circumscribed as local tenderness due to a localized inflammatory condition. However, it may at times simulate even such a condition.

For example last winter I had a patient who had suffered for years from headaches and a vague abdominal distress. She then developed a marked local tenderness under the *left* border of the ribs. She was thoroughly discouraged and when one pressed under the left border of ribs she winced with pain while she did not complain when the same pressure was applied on the right side. X-ray examination of stomach, colon, and also for possible diaphragmatic hernia, gave normal findings. The gall bladder, too, functioned normally on roentgenologic study. The history was quite vague. The patient was generally run down and despondent on account of carcinophobia; but she was not of the common complaining kind. The proposal to open and examine was gladly accepted by the patient, a fact which confirmed our impression that there must be some definite pathologic process behind all this. At operation the stomach and all the left-sided organs were found to be normal. The gall bladder, which we had under suspicion, having made an x-ray examination some time before, was white but did not show any further changes like adhesions, nor was there a fibrous network in the overlying liver tissue commonly found in chronic infection of the gall bladder. There were no stones. Hesitatingly we removed it and also a long somewhat club-shaped appendix. On opening the gall bladder it proved to be of the strawberry type. Eight days after the operation the notes read that she felt very well, was up and about since two days after the operation, and had no complaint. The daily headache from which she had suffered for fifteen years had gone since the operation and also the left-sided pain. None of these symptoms has troubled her from then on. Here we had a misleading localization of a referred pain on the opposite side.

In judging the subjective localization of pain we must also consider the following. The newborn baby does not have the ability to locate pain from the start. It has to learn first from which area a certain pain comes. This pain is then projected to the corresponding surface. Gustatory sensations (like all others) are formed in the brain, but projected to the mouth. Visual and auditory sensations are projected to locations outside of us at some distance. The baby learns this gradually by way of control and comparison. But we have very little or no experience with an exact localization of pain in the abdomen apart from the parietal peritoneum. Our ability to localize a pain inside is simply not developed. *In praxi* I find that surprisingly often the patient localizes his pain wrongly as to the affected side.

It is apparently proven experimentally, but not really understandable, that abnormal distention or contraction of a viscus can cause pain though the surgeons have proved that other painful manipulations as pinching, cutting, or burning are painless if pulling is avoided. After having observed this in hundreds of laparotomies under local anesthesia I cannot bring myself to accept the conclusions drawn from these experiments. Balloons were placed into the gall bladder and again into the duodenum and then distended. There must always occur a displacement or pulling to some extent on the neighboring posterior peritoneum which is extremely sensitive. This may explain the findings in experimental work. Pulling on the gall bladder is painful, but crushing or cutting it is not. An abnormally firm contraction will have a pulling quota on the adjoining posterior peritoneum, the same as distention.

An inflamed intestine or appendix does not hurt when pinched at operation unless we pull on these organs. Then the pain is severe because the posterior peritoneum is exquisitely sensitive to any degree of traction. And this is of course much worse when the posterior attachment is irritated by a continuation of the inflammation of the viscus. The most delicate handling of the intestines and particularly avoidance of any pulling is necessary to operate painlessly. Severe crampy contraction of part of the stomach wall where it is grasped by a probang during an operation is not felt in the least. The whole circumference of the small or large intestine can be caught in a crushing clamp and if we avoid pulling on the mesentery there is no sensation. There is no sensation even if a short loop of small intestine is in such firm contraction as to form a solid cord which one can see at times when operating under local anesthesia.

The large intestine cannot contract forcibly in its ascending and descending portions without a

pulling effect on the meso-colon which is very short. Thus severe contraction can well cause pain through the lateral attachment of the colon. But how about over-distention, which in experiments seemed to cause pain? If a long ileum loop is overdistended it straightens out more or less and becomes rigid, which will cause a pulling on the fan-shaped mesentery. This will not happen so readily in the small intestine as in the large one with its greater fixation. Thus the crampy pains in common minor disturbances as diarrhea have their origin practically always in the colon.

Head's and Mackenzie's findings often give valuable hints. For instance, a pain between the shoulder blades leads our attention immediately to possible gall-bladder trouble or a deep-seated ulcer. In the uppermost part of the abdomen several organs, if inflamed, will affect the same center of cutaneous sensation. The patient has no way of recognizing directly what organ causes the pain in this area. On the other hand localized tenderness, when present, is of course of particular value for a differential diagnosis.

An appendicitis patient, a man, was so emphatic that his pain was directly underneath the ensiform process and he was so incredulous as to my diagnosis that I was anxious to demonstrate to him that local tenderness over the appendix meant more than his spontaneous epigastric pain. I operated under local anesthesia. The reddened appendix rested against the posterior peritoneum. When I grasped it with an artery forceps there was no pain but when I pulled on it the patient suddenly reacted and told us emphatically with groans that he had again that old pain in the pit of the stomach but assured us that he felt absolutely no pain where we were operating. I said "if you count up to three your pain is gone." Though very evidently unconvinced he counted in a hurry, whereupon I released the tension without removing the forceps from the appendix. With a puzzled laugh he admitted the pain was gone. The pain of pulling must have been severe as he could not be induced to have the experiment repeated. We then infiltrated the mesenteries of the appendix and adjoining cecum which caused the remainder of the operation to be painless.

To corroborate the statement that even in severe inflammation the appendix and the walls of adjoining intestines have no sensation for pain let me tell you of the following case: A woman came to my office complaining of a "dysentery" from which she had suffered for a number of days. She looked quite sick, felt miserable and had fever between 101 and 102 degrees. She complained, however, of no particular or outspoken pain. In the right iliac region there was a movable mass the size of a woman's fist. It was not tender in itself and caused only moderate discomfort on being moved about gently. Operation revealed a gangrenous appendix in an abscess which was walled off entirely by the cecum, adjoining ileum and omentum. The cecum was of the "cecum mobile" type. There was no involvement of the anterior or lateral peritoneum and there was a rather long stretch of mesentery between the inflamed gut and the posterior peritoneum.

It should be mentioned that in appendicitis we almost always find a pain at McBurney's point even if the cecum is far down in the pelvis. This is due to the fact that the lymphatics from the appendix reach the posterior abdominal wall at this point even if the cecum and the appendix are low down in the pelvis. Infected lymphatics involve promptly the adjoining tissues as one well knows from the red streaks in lymphangitis of the arm or leg. This causes the peritoneum at McBurney's point to become very tender to pressure.

Concerning appendicitis Rovsing called attention to the following symptom. On pressing into the left iliac fossa a pain is at times felt on the right side. Rovsing thought this might be due to gas being forced from the left side of the colon over to the right. However, if we consider the long stretch of colon with its flexures that the gas would have to traverse, it is evident that this cannot well be the case. The explanation most reasonable is that we displace the intestines and create some pulling on the inflamed posterior peritoneum in the neighborhood of the appendix. When an inflammatory condition is suspected and gentle pressure causes no indication of pain, sudden release may be painful. This pain on rebound is proof that the primary palpation was properly gentle and it indicates a local irritation of the posterior peritoneum.

At times pain is felt far away from the place of trouble. Thus in a case of traumatic rupture of the diaphragm in its right parasternal portion, there was a pain in the right iliac region where

there was, however, no tenderness. The radiograph showed a loop of colon in the pleural cavity reaching as far as the upper level of the heart. This pain may have been a referred pain or was caused by traction.

The center of the diaphragm is known to yield only referred pain in the neck. However, the peripheral portions of the diaphragm yield local pain. In a case of long standing fever with a history of dysentery contracted in the South, a tenderness on pressing upward underneath the border of ribs led us to recognize a liver abscess which was ready to break through on the upper surface of the liver. It was the irritation of the peripheral diaphragmatic peritoneum which gave the information.

Though I have been able to observe many times during operations that the liver has no trace of sensitiveness, very large livers cause a vague "misery" partly from pressure, but, besides this, the weight and size may produce a pulling on the different fixatory ligaments.

The most important epigastric lesions are perforated ulcer, gallstone attack, and acute pancreatitis. Their differentiation especially in reference to the character of the pain may be discussed in short. In acute perforated ulcer, pain is overwhelming and the patient does not dare to move. He lies very quiet because the pain is peritonitic and every movement increases it greatly. On the other hand in an attack of gallstone colic the excruciating pain makes the patient throw himself around, and he often cannot even stay in bed, but gets up and doubles over. In pancreatic apoplexy or peracute pancreatitis the picture is again different. The pain is steady and severe, but not as excessive as in the two just mentioned conditions (perforated ulcer and gallstone attack). Because the anterior parietal peritoneum is not involved, the local tenderness is therefore not as severe as in perforated ulcer. The abdominal muscles are contracted but not as board-like as in perforated ulcer.* In pancreatitis the trouble is located primarily in the lesser peritoneal cavity. A leakage through the foramen of Winslow will only occur, if at all, at a later stage. There is a steady great pain due to the irritation of the posterior parietal peritoneum, but surface displacement which is the most sensitive of all does not occur here to any great extent. The involvement of the large sympathetic tracts and solar plexus brings about the outstanding feature in this condition, which is a sensation of impending death. The pulse, which is bounding for hours after perforation of an ulcer, is very feeble and thready in acute pancreatic disease.

The gall bladder apart from gallstone colics can be the seat of a steady pain in acute inflammation. The local pain and tenderness are clear-cut and well localized, due to involvement of the anterior or posterior parietal peritoneum or the lymphatics in the latter.

Pain, even quite localized, over the gall bladder occurs in coronary disease and one may find it so sharp on pressure, that the thought of a concomitant cholecystitis is often aroused. Ravdin and Royster have shown very recently that "many of the classical signs of angina pectoris" are seen in gallstone cases and are cured by operative measures. The distinction from true angina lies in the observation that the symptoms are not elicited by physical effort. They call the condition pseudo-angina.

Other serious errors occur at times. I remember on one occasion being consulted in a case which a colleague thought to be an acute cholecystitis for which he was ready to operate. I advised him to wait with any further measures until the lobar pneumonia which had escaped him was over. The pneumonia over, the pain was gone.

Of pain due to renal affection it can only be mentioned that at times the localization is poor or even very misleading. Cases of calculi are reported where the pain was located in the sound kidney of the opposite side. In the case of a recent descent of a stone in the ureter the pain usually is excruciating and radiates toward the bladder or testis. Let me tell you of the case of a very experienced surgeon. During an operation he was caught with an overwhelming pain in his own abdomen. Morphine helped little. When I saw him the pain was still severe and the whole abdomen of this large sized man was ballooned and hard. The patient thought the right iliac was more tender than the rest and in case it was an appendicitis no time was to be lost. He wanted to have this matter settled by exploration. Like the rest of the intestines the

*In the November meeting of the Minnesota Academy of Medicine, Dr. R. T. LaVake mentioned a case of acutely perforated ulcer right after childbirth. The abdomen was not at all hard and therefore the picture was very misleading. The overstretched abdominal muscles had not yet become shortened enough to allow the abdominal walls to become firmly contracted.

appendix was somewhat congested. It was removed, though we well saw that it did not account for the acute symptoms. Some time later this man passed a ureteral calculus from what he felt sure was the *left* side.

The ureter is normally devoid of sensation, but the excruciating pain when a calculus becomes stuck in it is only too well known. The nerve supply of the ureter proper comes entirely from the autonomis system. Though, according to J. C. White, the ureter itself is said to have afferent nerves, one may well look for the least part of painful sensation in its very close connection with the peritoneum. It is well known to the surgeon who has to attack the ureter and looks for it by the extraperitoneal route, that when he lifts the peritoneum off from the underlying structures in the iliac fossa he always finds the ureter on the peritoneal side of the wound on account of the marked degree of attachment between ureter and peritoneum. In case of abnormally severe contraction of the ureter the overlying peritoneum is pulled on and such displacement is particularly painful. How far such an explanation of the pain in ureteral colic holds good is hard to decide. Stripping and freeing the ureter has brought about relief in cases of ureteral pain and colic, but was it not due to the separation from the closely adherent peritoneum? In catheterizing the ureter, pain is first felt by the patient on entering it as a bladder sensation. From then on there is no pain or sensation unless the catheter is inserted too far and impinges on the upper calix in the renal pelvis. The kidney pelvis has sensation, though the kidney parenchyma has none.

The microscope has shown that the nerve fibres of the autonomic system have no myelin sheath or at most a doubtful indication of such in the form of a faint stippling surrounding the fibres. A well developed myelin sheath is considered to be the attribute of somatic nerves. However, it has been observed that in the superior pelvic plexus about one-third of the fibres are sheathed with myelin. In the paravertebral sympathetic chain also have been found large myelinated neurones. This would mean that somatic sensory fibres run along in the track of nerves which are classed as belonging to the autonomic system. Indeed, this microscopic investigation followed the clinical observation of surgical relief from certain pelvic illnesses as uncontrollable dysmenorrhea. The superior pelvic plexus, also called the presacral nerve, can be dissected out from between the shanks of the bifurcating aorta downward and this has given surprisingly good results in different pelvic troubles. My experience is limited to five cases, in all of which satisfactory results were obtained. In one instance it was not much more than an experiment, inasmuch as I had not read of such procedure for the condition with which we were confronted. On that account I will describe the case in short, though it really lies outside the subject of "abdominal pain." A woman, about fifty-five years old, was suffering from a pruritus vulvae which made her act like a maniac and drove the whole family to despair. With a distorted face she moved about excitedly and incessantly. Then at intervals she would suddenly stop and scratch herself violently amid groans. She had had local and general treatment by other doctors. Local injections by us were of no avail. As a last attempt we resected the superior pelvic plexus with not only immediate but perplexingly complete relief. There has been no sign of any return of the trouble since the operation which was done about six years ago.

Results with resection of the presacral nerve stimulated closer investigation. Learmont's studies made in common with Braasch are outstanding in this field. They observed that a crushing pain in the bladder was complained of on grasping the nerve. Learmont states that these afferent neurones run with the sympathetic nerve tracts and reach the spinal cord between the ninth dorsal and the fourth lumbar segments. These fibres conduct pain, but the mentioned authors found that after resection of the presacral nerve the sense of touch or pain in the bladder is not abolished but instead remains good on intravesical manipulation. Indeed, the relief from the bladder pain after resection of the presacral nerve was not complete. Though it is often difficult to be sure that all the fibres of the presacral nerve have been divided because it varies greatly in the distribution of fine lateral threads, Learmont came to the conclusion that much of the sensation, especially of the lower portions of the bladder, runs with the parasympathetic tracts which join the sacral nerves.

In summing up the observations on abdominal pain, emphasis must be given Lennander's findings that the parietal peritoneum is by far the

most sensitive structure in the abdomen and as it is supplied with somatic nerves, it gives us the most direct and most helpful information. Besides this there are myelinated sensory fibres running along autonomic tracts, though (because they are myelinated) they are considered as belonging to the somatic system. In addition there are apparently afferent fibres in the sympathetic network which report trouble to the nearest sensory centers. Their messages, though often quite loud, are much less clear and definite than those of the somatic system.

EVOLUTION OF NEUROSURGERY

ALFRED W. ADSON, M.D.
Rochester, Minnesota

DURING the past twenty-five years I have had the privilege of observing and participating in the evolution of neurosurgery. The outstanding achievements in this period have been: (1) more accurate localization of lesions of the brain and spinal cord, (2) pathologic knowledge concerning the life cycle of neoplasms and inflammatory lesions of the central nervous system, and (3) the refinement of surgical methods dealing with lesions of the central nervous system, such as (a) selecting the proper anesthetics for the various procedures, (b) perfecting asepsis, (c) more accurately controlling bleeding, (d) simplifying craniotomy and laminectomy, (e) developing a better knowledge of intracranial pressure with control of surgical shock, and (f) developing surgical procedures in the treatment of lesions now included in the scope of neurosurgery.

The improvements in the localization of lesions involving the brain and the spinal cord have been due to many factors. The anatomic and physiologic knowledge of the central nervous system has been increased tremendously. Clinicians with the aid of the pathologist have come to understand, evaluate and distinguish lesions, thus selecting lesions that lend themselves to surgical treatment. The use of air or oxygen in studies of the ventricular system and the subarachnoid spaces has contributed much in the further localization of neoplasms. These studies are referred to as pneumo-encephalographic, ventriculographic and myelographic studies. Malformations of normal ventricles and subarachnoid spaces do not only indicate the position of the lesion but also are of value in determining the accessibility and the operability of neoplasms and abscesses.

Electro-encephalography is one of the newer diagnostic procedures employed in the differential diagnosis of cerebral lesions. It is of great value in distinguishing functional disorders from the organic disorders. This is especially true in the epileptic group. It is of moderate value in localizing neoplasms in the absence of increased intracranial pressure. As yet, the findings are too uncertain to be of surgical value in the presence of markedly increased intracranial pressure. The electro-encephalographic findings are also uncertain as a differential aid when the patient presents symptoms that might be attributed to a neoplasm, cerebral thrombosis, or a subdural hematoma. It is very possible that electro-encephalography will prove of greater value in the localization and the differential diagnosis of cerebral lesions as knowledge of abnormal brain waves increases.

The ophthalmologist plays no small part in the localization of cerebral neoplasms. The presence or absence of papilledema and other changes of the fundus with the numerous types of defects of the perimetric field contribute inestimable knowledge in the localization of cerebral lesions. The radiologist likewise contributes a large share in the differential diagnosis. The roentgenogram not only reveals the presence or absence of increased intracranial pressure but also reveals localized erosion and hyperostosis of the skull and vertebræ, which often assists in the localization and in the definition of the character of the lesion as well.

In the beginning of the specialty, some fifty years ago, little was known about the nature and the life cycle of cerebral neoplasms. Too often they were looked upon as inoperable lesions and all classed as gliomas. During these past twenty-

From the Section on Neurosurgery, The Mayo Clinic.

five years the pathologists have not only distinguished the various tumors, but they have also shown that the gliomas differ in character and rate of growth. Although many are rapid in their growth, others grow slowly. In order to illustrate this point, I wish to include the following four paragraphs prepared by our neuropathologist, Dr. James W. Kernohan, of the Mayo Clinic:

The contributions by neuropathologists or others working in the laboratories were almost wholly in the field of histology and were made possible by use of refinements in histologic technique and newer staining methods. Originally, all tumors of the nervous system were grouped together, but the encapsulated tumors were the earliest ones to be separated. These tumors were outside the substance of the brain and spinal cord and were recognized to be of two types; the first arose from nerve roots of the spinal cord and the eighth cranial nerve, and were called neurofibromas and later perineural fibroblastomas. The other group arose from the meninges and were referred to as dural endotheliomas. Mallory pointed out that the dura had no endothelium and that these tumors were meningeal fibroblastomas. However, there was some question as to their origin from the arachnoid cells, and Cushing adroitly avoided this controversy by calling them meningiomas. Later years have led to various subdivisions of these meningeal tumors by Bailey and Bucy, Globus, and still later, Cushing and Eisenhart.

Tumors of the pituitary body also were subdivided into the three types representing the three types of cells in the normal pituitary body, namely, chromophobe, eosinophil and basophil tumors. Being of epithelial origin and being, as a rule, slowly growing neoplasms, they have been called adenomas rather than carcinomas. Each produces a characteristic syndrome; however, the chromophobe adenomas are the ones most commonly requiring surgical intervention for relief of visual disturbances, Eosinophil adenomas produce the most characteristic syndrome of acromegaly, while basophil adenomas do not, as a rule, call for surgical intervention. Of the tumors in the neighborhood of the pituitary body, the most common type is the craniopharyngioma, although it has at times been called adamantinoma, supracellar cyst, Rathke pouch cyst, and so forth. This tumor is most commonly seen in young adults, and since it usually contains calcium salts, it can frequently be visualized and diagnosed by roentgenography.

Many attempts had been made to subdivide the most common tumors of the brain, namely, the gliomas. It remained for Bailey and Cushing, in 1926, to subdivide this interesting group of tumors in a practical and useful manner. They based their work, to a considerable extent, on the excellent metallic impregnation methods of Cajal and his pupil, Del Rio Hortega. It also required a large number of tumors obtained at surgical operations for histologic study, which they correlated with carefully taken clinical histories. This excellent contribution by Bailey and Cushing has remained the basis of all such studies since that time. Only very minor changes have been suggested, and some of these are perhaps unnecessary, being only refinements of the original contribution. This advance by Bailey and Cushing has been of great help to neurosurgeons since it allows them to vary the methods of surgical treatment, whether they employ radical procedures in the relatively benign, slowly growing types, with hope of prolonged, if not permanent cure, or a limited procedure in the highly malignant gliomas with rather hopeless prognosis. This subdividing of the gliomas has been the greatest single contribution which neuropathologists have made in aiding neurosurgeons.

There have been many other contributions of lesser or minor importance by which neuropathologists have aided in the advances made by neurosurgery, but it does not seem justifiable to enumerate them here.

Historical

Cranial surgery[2] dates back to the ancient Egyptians, Romans, and Peruvians, who trepanned skulls to give egress to the evil spirits within, but who also must have treated injuries of the skull if explanation is to be made of the extensive defects present in the skulls preserved in museums. Traumatic cranial surgery undoubtedly was practiced during the various epochs before modern antiseptic and aseptic surgery were introduced. Records show this was true during the Napoleonic wars. The depth of the surgical procedures was limited by the dura, as those who penetrated below the dura met with failures resulting from suppuration.

Richmond Godlee,[4] of London, is accredited with being the first successfully to remove a tumor of the brain. The tumor had been localized by Bennett, who employed the newer neurologic methods. Godlee was able to accomplish the removal by employing Lister's antiseptic technique. The date of this operation was November 25, 1884, and the results of the procedure were reported in 1885. Ballance, in his monograph, "A Glimpse into the History of Surgery of the Brain,"[3] stated that Heyman, in 1931, had removed a tumor of the parietal bone from a patient, eight years of age, who had jacksonian convulsions. Other similar references are found in literature, but the reports differ from that of Godlee in that localized cranial signs, such as presentation of the tumor through the bone, led to the localization, rather than the neurologic symptoms which Bennett observed in localization of the growth. MacEwen, as early as 1876, had

diagnosed an abscess of the frontal lobe because of the contralateral hemiplegia and proposed operation which had been refused by the parents of the patient. Subsequently, the patient died, and MacEwen carried out the steps of his proposed operation at necropsy, and found the abscess. He too had operated on several tumors of the brain using lesions of the skull as localizing signs, before Godlee had operated in his famous case. However, MacEwen's report of abscess entitles him to be called the father[10] of modern neurologic surgery. In the discussion of Godlee's paper, Ferrier reported a case in which tumor of the brain had been localized neurologically; Lister had trepanned but had failed to expose the tumor, but he did so eight days later at necropsy, when he found the tumor in the region explored. At the reading of Godlee's paper, Horsley also was present, and because of his interest in neurology and in the restriction of a surgical field to that of the central nervous system, it has made him the outstanding leader in the pioneer development of neurosurgery.

Weir, of Philadelphia, is accredited with being the first surgeon in the United States successfully to have removed a brain tumor. This operation was performed November 17, 1887, and was reported in 1888. In 1891, Keen reported five cases in which cerebral operations were performed. In the same year, C. H. Mayo[11,12] reported two cases, the first of successful drainage of a brain abscess, and the second of ligation of a common carotid artery for an arteriovenous fistula in the cavernous sinus, with a successful result. Knapp, of Boston, in 1891 collected from the literature and reported forty-six cases in which operation had been performed in the preceding six years and stated that thirty patients had survived the operation, fifteen had died, and the fate of one had not been reported.

Keen, in 1895, commented on the fact that in spite of the rapid progress and brilliant achievement of modern antiseptic surgery, cerebral surgery had made but little advance until 1886, when Horsley and MacEwen introduced radical changes in surgical technique. He stressed the importance of disinfection and urged that the head be shaved a day before the operation, that it be well scrubbed with soap and water before applying ether and the 1:2,000 sublimate solution. He emphasized the importance of the precept that the surgeon's arms, hands and fingernails be thoroughly cleansed, and that the instruments and dressings be scrupulously clean. He referred to the Wagener-Wolfe osteoplastic flap, but advocated removal of the bone overlying a tumor by cutting the bone between the trephine openings. He closed the skin flap without replacing the bone until a secondary operation. The dura was closed with sutures of catgut and the skin with interrupted sutures of silkworm gut. The wound was covered with ample sterilized dressings which were kept in place by wet bandages covered by muslin bandages. In 1896, Keen presented another paper entitled "The Surgical Treatment of Intracranial Tumors," in which he reviewed the status of surgery of the brain. He complained of ineffective methods of localization of cerebral tumors and emphasized the importance of having the coöperation of a neurologist and an ophthalmologist in consultation. He believed that the roentgen rays, which had come into moderate use, should offer aid. In reviewing the various types of craniotomy, he stated that the Wagener-Wolfe method consisted of exploration by raising an osteoplastic flap over a circumscribed area. Horsley, in employing the osteoplastic flap, cut the bone between the four trephine openings with a straight saw. Krause changed this technique by employing a motor-driven circular saw, and Cryer employed a motor-driven circular osteotome in cutting the margins of the bone flap. Doyen advocated a more radical procedure, in that his osteoplastic flap amounted to hemicraniotomy. Keen said that if the tumor were small, the operation should be completed in one stage, but if it were large, it would be better to divide the operation into two stages. He advocated that Horsley's bone wax be used for the control of venous bleeding along the cut margins of the skull, that the meningeal vessels be ligated and that only venous oozing be controlled by gauze packs.

Technique of Craniotomy

The technique of craniotomy as it is employed today has become a rather standard technique. One of two types is used. When a large area of the cerebral hemisphere is to be uncovered, the osteoplastic-flap craniotomy is employed. When a limited area is to be uncovered, or structures within the posterior fossa are to be explored, the decompression type of craniotomy is used. The osteoplastic-flap type of craniotomy consists in reflecting a portion of scalp with the

underlying bone attached to the scalp and muscles in order that the bone may be replaced and held in position at the conclusion of the operation. The decompression type of craniotomy consists in reflecting or elevating the scalp and muscles for the removal of the bone with the rongeur, with no attempt to replace the bone that has been removed.

Anesthesia.—Neurosurgeons, like general surgeons, have experimented with various types of anesthetics. Those that are accepted today are as follows: Local anesthetics are used when limited procedures are employed, when patients are comatose, or when general anesthesia is contra-indicated. Intravenous anesthesia, pentothal sodium, may be used as an induction anesthetic and is of value in traumatic surgery when only a short anesthesia is indicated. Avertin, administered by rectum, supplemented with inhalation of ether, is preferred by a group of neurosurgeons. The anesthetic of choice for major neurosurgical operations, based on my own experience, is ether administered by inhalation. The technique consists of induction of anesthesia with nitrous oxide, followed by administration of ether by the drop method until the patient is thoroughly relaxed, at which time the Magill intratracheal tube is inserted. Anesthesia is maintained with ether, administered by the drop method on the open mask. This procedure permits an open airway without suffocation, an advantage which results in the use of a lesser amount of anesthesia, the avoidance of increasing the intracranial pressure by venous stasis and the facilitation of the use of oxygen in the event it becomes necessary in controlling surgical shock.

Asepsis.—Aseptic technique is an important factor in all surgical procedures performed on structures within closed cavities of the body. Its importance cannot be over-emphasized in neurosurgical operations, since structures of the central nervous system are extremely vulnerable to infection.

Hemostasis.—The achievements of cerebral surgery bear a direct relationship to the improvement in methods for the control of bleeding. It is amusing to review the literature which describes the means that surgeons in the early days of the specialty resorted to in the control of hemorrhage during craniotomy. Today, scalp bleeding is controlled with a hemostatic clip. Few surgeons still employ the compression method by applying Kelley forceps to the galea. Bone bleeding is controlled by applying wax to the cut surfaces of the bone. The wax most universally used is prepared after the formula suggested by Horsley. Meningeal bleeding is readily controlled by silver clips which were introduced by Cushing. Silk ligatures employed for the larger vessels, whether arterial or venous, have continued to be extremely effective in controlling hemorrhages. Electrocoagulation has proved most effective and is a substitution for silver clips and ligatures for the control of smaller blood vessels in the scalp, muscles, dura and cortex. Electrocoagulation has added a valuable factor in the removal of encapsulated tumors, since it has made possible the removal of these tumors piecemeal through a very small opening; whereas previously these same tumors had to be considered as inoperable.

Elevation of Bone Flaps.—The technique of elevating bone flaps has likewise gone through a series of changes. The accepted procedure today consists of making several trephine openings at the margin of the proposed flap, after which the intervening bone areas are cut with a Gigli saw. The base of the flap is usually broken by elevating the peripheral margin of the flap. A variety of drills has been invented for the purpose of making the trephine openings. Osteotomes and skull plows have also been devised. However, when one takes into consideration the time factor necessary to adjust these various electric appliances, it becomes apparent that the bone flap can be elevated more quickly by the use of sharp cutting burs and a good steel saw than by the use of the various electric drills and saws.

Closure of Flap.—As neurosurgeons have become more interested in the removal of tumors than in the performance of a craniotomy, changes have been made from time to time in the selection of incisions and shapes of various osteoplastic flaps, in order to facilitate a more direct approach to the neoplasm. Fewer negative explorations result from the better localization of cerebral lesions. Though decompressions are still resorted to, precautions are taken to avoid cerebral herniations. In the event a decompression becomes necessary following an osteoplastic-flap

craniotomy, the bone is removed at the base of the flap over the temporal lobe, but the remaining portion of the bone flap is wired into place. In order to avoid cerebellar hernias, extreme care is taken to close the structures on anatomic planes with interrupted sutures of silk.

Control of Intracranial Pressure.—The control of intracranial pressure during a craniotomy has always been a perplexing problem. The aspiration of a dilated lateral ventricle invariably suffices. In the event the neoplasm is of such size as to have compressed the ventricles and subarachnoid spaces, hypertonic solutions of dextrose have been necessary as a rule to prevent disastrous results during the operation. However, with the use of the intratracheal tube in administering the anesthetic, the problem of controlling the increased intracranial pressure has been greatly minimized owing to the fact that venous congestion of the cerebral veins and sinuses has been markedly reduced because of the open airway afforded during the anesthetic.

Shock.—Surgical shock results from loss of blood at the operative site, loss of fluids, loss of proteins into the tissue, and exposure and trauma of the structures in the surgical field. The fall in blood pressure accelerates the phenomenon of shock and brings about a state of anoxemia. Thus it is the duty of the surgeon to operate expeditiously, maintain the fluid balance (supplementing blood or plasma if necessary), and administer oxygen along with the air during the anesthesia. Surgical shock is best controlled before it develops. If the craniotomy proposed is to be a major affair, it is wise to begin the intravenous infusion of physiologic salt solution and dextrose before blood pressures begin to recede.

Purpose of Craniotomy

Craniotomy originally was designed to resect or decompress cerebral neoplasms and to drain abscesses of the brain. However, today it also is employed to gain access to other diseased structures within the cranial cavity. Among the lesions that are being attacked in this manner are aneurysms of the cerebral vessels. The one most effectively controlled is the arteriovenous fistula between the internal carotid artery and the cavernous sinus, which gives rise to a pulsating intracranial mass situated in the middle fossa and produces intracranial symptoms, a pulsating exophthalmos, oculomotor palsies and blindness. The treatment employed is the control of the arteriolar flow into the pulsating vascular mass, after having assured oneself that it is possible to obliterate the flow of blood through the internal carotid artery on the side of the lesions without producing a contralateral hemiparesis. Although it is possible in a number of cases to control the symptoms by ligating the internal carotid artery in the neck, neurosurgeons are frequently called upon to trap the arteriovenous fistula. This is done by ligating both the external and internal carotid arteries in the neck, followed by an intracranial ligation of the internal carotid artery on the cerebral side of the fistula before cerebral vessels are given off. In addition, I have found it necessary to obliterate the ophthalmic artery from within the cranium to prevent the reverse flow of arterial blood into the cavernous sinus through the arteriovenous fistula. I also have found it an advantage to do a venousectomy on the ophthalmic veins to reduce further the exophthalmos. Even though the ophthalmic artery has been ligated, in addition to the internal carotid, I have learned that the vision was preserved.

Aneurysms on other cerebral vessels have been resected. It must be borne in mind that such procedures cannot be carried out promiscuously unless there is the assurance of adequate collateral circulation. Arteriovenous varices of cerebral vessels occasionally are amenable to ligation and electrocoagulation.

Lobotomy

Lobotomy as a surgical procedure in the treatment of insanity represents one of the newer phases of neurosurgery. It was initiated by Moniz and brought to the fore by Freeman and Watts. The operation is now being performed by several neurosurgeons in various clinics. The operation is performed through a trephine opening over the premotor area and is designed to interrupt most of the fibers which pass between the frontal lobe and the midbrain. The object of the operation is to diminish the incoming impressions which give rise to the aberrations of mental reaction, characterized by disturbed mental states. Although the procedure is still in the investigative state, it does appear that certain

results have been accomplished. The two types of mental states most favorably affected are those of compulsion neurosis and involutional melancholia. Perhaps the postoperative interval is not of sufficient duration to evaluate the final results. One investigator made the comment that it was his opinion "that it made certain crazy individuals less crazy."

Premotor Resection

Premotor resection for Parkinson's disease is another one of the new neurosurgical operations. Klemme is the chief exponent of this procedure. According to his report on unilateral lesions, worth-while results have been accomplished. Unfortunately other surgeons have not been so successful. It is difficult at this time to evaluate the results accomplished. Since there are many sufferers of this disease, further investigation is justified. However, it should be borne in mind that a high morbidity accompanies the operative procedure.

Neuralgia

The major neuralgias, trigeminal neuralgia and glossopharyngeal neuralgia, have come to be known as distinct clinical entities. Each presents a definite syndrome. Palliative relief can be obtained in the treatment of trigeminal neuralgia by the injection of the peripheral branches with concentrated alcohol. This is not true in the treatment of glossopharyngeal neuralgia, since it is impossible to inject the ninth cranial nerve without injecting other nerves, such as the vagus, which lies in close proximity to the glossopharyngeal nerve. Peripheral avulsion as a surgical procedure in the treatment of trigeminal neuralgia has been abandoned with the exception of that of the ophthalmic branch, since the alcohol injection has proved more effective than the avulsion. Since both diseases are similar in characteristics, with the exception that they involve separate nerves, the attacks of pain will return unless the sensory component of each nerve is sectioned within the cranium. A resulting anesthesia must be accepted by the patient. The sensory root of the fifth cranial nerve may be subtotally or totally divided by either a transtemporal or a suboccipital approach. Although arguments are put forth to support the respective approaches, it appears that the transtemporal approach is the preferable one, since it is more universally employed by neurosurgeons. The unilateral, suboccipital approach to the ninth cranial nerve is the procedure employed in dividing this nerve in the treatment of glossopharyngeal neuralgia, since no other approach affords access to the intracranial portion of the nerve. In order to diminish the paresthesia that occasionally follows the section of the sensory component of the trigeminal nerve in elderly individuals, Sjöqvist devised and performed a tractotomy, sectioning the fibers of the fifth cranial nerve in the pons. Unfortunately, this operation did not achieve the objective for which it was designed, although it did relieve the trigeminal neuralgia. The postoperative sequela, which included cerebellar disturbance, limited the usefulness of the operation.

Subarachnoid Injection of Alcohol.—Subarachnoid injection of alcohol is a useful procedure in a limited number of painful conditions resulting from metastasis and herpes zoster. Unfortunately, there still exists a variety of neuralgias that are not amenable to surgical treatment, a fact which offers a challenge to investigators in this field. The more common ones are the so-called intercostal neuralgias, sphenopalatine neuralgias, and the multiple neuralgic pains that follow the extraction of teeth. Painful stumps and causalgias still present problems that are asking for solution. Occasionally, relief is obtained by the amputation of a neuroma and the injection of a nerve with alcohol. A sympathectomy offers some relief. Chordotomy, a procedure which is designed to section the spinal thalamic tract of the spinal cord in order to relieve painful sensation, has proved of value in the treatment of pain resulting from metastasis, but since subarachnoid injection of alcohol is a simpler procedure and is frequently effective in relieving pain, it has come to replace the major procedure to a great degree.

Tumors of the Spinal Cord

Tumors of the spinal cord occur much more frequently than was formerly thought. During the past twenty-five years, the neurologist has done much to elucidate the symptom complexes that result from the various types of intraspinal tumors which produce pressure on the spinal cord or invade it. The pathologist has likewise shown that most of these tumors are nonmalignant. He also has shown that the ependymal cell glioma arising from the filum terminale, does

not metastasize and that cures can be effected if it is completely removed.

Since 80 per cent of the intraspinal tumors are benign, their growth is slow, which accounts for the slow development of clinical symptoms. Tumors may be situated within the spinal canal, but extradurally. The largest group is situated within the dura, but extramedullary. The smallest group is situated within the spinal cord itself. The tumors most frequently arise from the meninges and nerve roots. They may arise from any of the structures within the spinal canal. When they are attached directly or indirectly to a nerve root, root pain is the first symptom to appear. As their growth proceeds, localized pressure and displacement of the spinal cord take place, which produce symptoms that indicate the nerve tracts involved. If the lesion is not recognized, the tumor may grow to such a size as to compress completely the spinal cord and produce the classic picture of transverse myelitis. This phenomenon helps to distinguish intraspinal tumors from inflammatory and degenerative processes. Spinal puncture, the elicitation of the presence or absence of spinal subarachnoid block, Queckenstedt test, as well as the radiologic study of the osseous structure of the spinal column, myelographic study and radiographic study of the opaque oil within the arachnoid space of the spinal canal are valuable adjuncts in making an accurate diagnosis. Thus it is obvious that the sooner a tumor is recognized and removed, the less damage it will do and the better will be the postoperative results.

Protrusion of Intervertebral Disks

Although protruded intervertebral disks are the result of injury to the annulus fibrosus with partial or complete prolapse of the nucleus pulposus, they have undoubtedly existed for all time but have only recently become recognized as a common cause for low back and sciatic pain. Occasionally, these lesions appear in other portions of the spinal column and produce symptoms not unlike those of an intraspinal, extradural tumor. Those that appear in the cervicodorsal region, which are second in frequency to those that occur in the lower lumbar region, are invariably the result of severe trauma. Again, the recognition of these lesions was originally due to myelographic studies. Lipiodol was the first opaque substance used to identify these lesions. It is still used, but since there is some question as to the irritation it may produce, the oil is removed at the conclusion of the test. Air and oxygen and even helium have been substituted for lipiodol in the myelographic studies. More recently, a substance called pantopaque, which can be removed more readily than lipiodol, is being employed to localize and identify the lesion.

Undoubtedly, the occasional injury, with the resulting incomplete protrusion, heals spontaneously, but more often than not the symptoms recur. Surgical intervention then is necessary. Formerly the protruded mass was removed through a bilateral laminectomy; now we have learned that it can be removed through a limited unilateral laminectomy; and occasionally, as Doctor Love has suggested, it can be removed without a laminectomy after removing the hypertrophied ligamentum flavum that resulted from the original injury.

The question of whether or not a bone graft should be inserted at the time the protruded portion of the disk is removed has been a subject of much discussion. Inasmuch as we have had the opportunity of observing a large number of cases in which protruded disks were removed without fusion and with fusion, we have come to the conclusion that fusion should be combined with the removal of the protruded portion of the disk when there is present an anomaly of the lower lumbar vertebræ, such as sacralization of the fifth lumbar vertebra, malformations of the arch of the fifth lumbar vertebra, beginning spondylolisthesis and active hypertrophic arthritis.

Occasionally it is advisable to perform a combined operation when there is a history of long-standing static backache in addition to the symptoms produced by a protruded intervertebral disk. Furthermore, it occasionally is advisable to perform a combined operation on a patient who is a laborer, who is compelled to perform unusual, heavy work, such as one who handles freight or one who is a stone mason. The results achieved by operation are in direct proportion to the irreparable damage produced by the protrusion of the nucleus pulposus. They are inversely proportionate to the amount of industrial compensation and disability insurance sought by the individual.

Operations on Peripheral Nerves

Operations on the peripheral nerves were formerly limited to the repair of the injured nerve. Today their scope has extended to include

esions of the sympathetic nervous system. It is generally accepted that the ideal repair of an injured nerve is an end-to-end anastomosis after resecting the neuroma. The apposition of the nerve ends is maintained by interrupted sutures of fine silk. The surgical field must be dry and free from sepsis. The ideal time to anastomose the nerve is six weeks after all evidence of infection has disappeared. Occasionally, one has to take advantage of flexion and adduction of extremities and even the transfer of nerves in order to bring about an approximation of the nerve ends. When it is impossible to bring the nerve ends together, autogenous cablegraphs or tubes of various substances have been employed to encourage the outward growth of axones. Unfortunately, the distance cannot be too great; if it is much more than a centimeter, cicatricial changes take place before the axones reach the distal portion of the nerve. If there is a preponderance of scar tissue, one should attempt to place the sutured portion of the nerve in a new muscle plane.

As the physiology of the sympathetic nervous system becomes better understood, it appears that vasoconstrictor impulses passing over gray rami are responsible for vasospastic disorders affecting the peripheral vessels of the extremities, which gives rise to such disease as Raynaud's disease and other peripheral vascular disorders that are aggravated by vasospasm. This being true, a variety of operations has been devised and employed to interrupt these impulses and thus relieve or ameliorate the symptoms produced by vasospasm.

Sympathectomy

The control of essential hypertension without renal involvement has likewise interested the neurosurgeon and prompted him to devise procedures for sectioning splanchnic nerves, including the two upper lumbar sympathetic ganglia on both sides, with the hope of interrupting the vasoconstrictor impulse to a large vascular bed, thus creating a reservoir and a safety valve. This procedure is probably one of the steps in an attempt to control essential hypertension. The results justify the continuance of this procedure in select cases until such a time that an antipressor substance may be developed and given safely with effective results.

Summary

The object of this discussion has been to review some of the progress made in neurosurgery and to indicate the scope which it may include. I am aware of its limitations but am likewise aware that the specialty is still in its infancy. Surgical indications may be altered, procedures undoubtedly will change, new procedures will arise, and a more accurate selection of surgical lesions will be made with the hope that more will be achieved with each operation performed.

References

1. Adson, A. W.: Intraspinal tumors; surgical consideration. Internat. Abstr. Surg., 67:225-237, (Sept.) 1938.
2. Adson, A. W.: The surgical consideration of brain tumors. Northwestern Univ. Bull., Med. School, 35:1-42, (Dec. 31) 1934.
3. Ballance, C. A.: A Glimpse into the History of the Surgery of the Brain. Loudon; Macmillan and Co., 1922.
4. Bennett, A. H., and Godlee, R. J.: Quoted by Adson.[2]
5. Freeman, Walter, and Watts, J. W.: The radical treatment of psychoses and neuroses; alterations in personality following prefrontal lobotomy. Dis. Nerv. System, 3:6-15, (Jan.) 1942.
6. Keen, W. W.: Quoted by Dandy, W. E.: The brain. In, Lewis, Dean: Practice of Surgery, 12:Chp. 1, 1-682. Hagerstown, Maryland; W. F. Prior Co., 1942.
7. Keen, W. W.: Three successful cases of cerebral surgery; including (1) the removal of a large intracranial fibroma; (2) exsection of damaged brain tissue; and (3) exsection of the cerebral centre for the left hand; with remarks on the general technique of such operations. Am. Jour. Med. Sci., 96:329-357; 452-465, 1888.
8. Knapp, A.: Quoted by Dandy, W. E.: The brain. In, Lewis, Dean: Practice of Surgery. 12:Chp. 1, 1-682. Hagerstown, Maryland; W. F. Prior Co., 1942.
9. Love, J. G.: Removal of protruded intervertebral disks without laminectomy. Proc. Staff Meet., Mayo Clin., 14: 800, (Dec. 13) 1939.
10. MacEwen, William: On the surgery of the brain and spinal cord. Med. News, 53:169-175, (Aug. 18) 1888.
11. Mayo, C. H.: A contribution to cerebral surgery: I. Cerebral abscess; recovery. II. Arteriovenous aneurism in cavernous sinus; operation; recovery. Northwest Lancet, 11:59-60, 1891.
12. Mayo, C. H.: Quoted by Adson.[2]
13. Moniz, E.: Quoted by Freeman and Watts.[5]
14. Sjöqvist, O.: Studies on pain conduction in the trigeminal nerve: a contribution to the surgical treatment of facial pain. Helsingfors: Mercators Tryckeri, 1938.
15. Weir, R. F. and Seguin, E. C.: Contribution to the diagnosis and surgical treatment of tumors of the cerebrum. Am. Jour. Med. Sci., 96:25-38, 1888.

SIGNS OF MENTAL SICKNESS TAUGHT MILITARY POLICE

Teaching the military police to recognize signs of incipient mental and emotional sickness in able-bodied soldiers is one of the war aims of the National Committee for Mental Hygiene, Dr. George S. Stevenson, medical director of the committee, reported at its annual meeting in New York.

The M.P.'s and also Red Cross workers, physicians in the armed services, company officers, chaplains, USO, Special Services (morale), and instructors are in a position, Dr. Stevenson said, to see the signs of an impending break in mental health and to see that the soldier gets special attention before he reaches the stage of serious mental sickness requiring hospitalization.—*Science News Letter,* December 5, 1942.

PROGRESS IN THE DIAGNOSIS AND TREATMENT OF DISEASES OF THE UROGENITAL TRACT

GILBERT J. THOMAS, M.D.
Minneapolis, Minnesota

THE successful and continuous publication of a scientific magazine of the calibre of MINNESOTA MEDICINE for a period of twenty-five years is an accomplishment about which the members of the State Medical Association should be proud.

MINNESOTA MEDICINE was conceived during the period of our participation in the last World War. It flourished during this difficult period and now, after twenty-five years of successful publication, we find ourselves again confronted with the difficult job of publication during a total world-wide war.

The papers, monographs, case reports, and other scientific material appearing in this magazine are carefully selected and edited. They contain useful information for the general practitioner as well as the specialist. The editorials and news letters from the officers are informative and keep the busy practitioner enlightened concerning medical economies and other subjects that are related to the ethical practice of medicine. A glance at the abstract sections of some of our leading national magazines frequently reveals abstracts of selected articles that have been published in MINNESOTA MEDICINE.

The present editorial staff of the journal has done an excellent job. The work of editing, which is sometimes onerous and always time-consuming, receives little or no notice or commendation from the membership. I take this opportunity of personally congratulating Dr. Carl B. Drake and his staff.

My contribution to this Anniversary Number will deal with a short review of the progress that has been made in the diagnosis and treatment of a few medical and surgical conditions that arise in the urogenital tract.

One of my first papers published in MINNESOTA MEDICINE was concerned with renal infections. This paper contained data obtained during my attempt to classify the bacteria that were identified when cultures were made from infected urine specimens. One important fact that I learned during this clinical research was that cultures made from specimens of urine obtained at this time and for the purpose of this investigation were not always uncontaminated because instruments and ureteral catheters might not be completely disinfected or sterilized. One conclusion that I formulated was that the bacteria obtained by culture from one specimen of urine might contain secondary invaders and not the primary infecting organism. During the twenty-five years that have elapsed since my attempt to add something to our then incomplete information about bacterial causes of renal infections, great advances have been made not only in the more accurate diagnosis of the bacteriological cause of renal infection but in the treatment of this condition.

The first advance that speeded our ability to successfully cope with renal infection was the development of an improved sterile technique for obtaining specimens of urine for culture. The next advance was made by bacteriologists who were able to make accurate differential diagnoses of the type and strain of bacteria present after a careful study of the cultural characteristics of the bacteria they grew on various media from specimens of urine obtained with aseptic technique. This feat was particularly useful to the urologist and the clinician when differential diagnosis of the various strains of colon bacilli was accomplished. This was achieved by accurate observation of the behavior of colon bacilli in the production of gas and in the acid-alkaline reaction of culture media that contained sugars.

Another contribution to the control of and sometimes the cure of renal infections was the observation of the effect that change in the physical properties of the urine has on bacterial growth.

The surface tension of the urine was changed by the oral administration of certain drugs that were eliminated in great part in the urine. This physical change in the urine did produce bacteriostasis in many instances and a bactericidal action in many. However, this physical change was not always produced by the drugs used for this purpose and when it was, bacteria were not always killed.

Another advance was made in the successful

control of renal infection when careful observation of the physical properties of the urine disclosed that certain bacteria were most often found in urine whose hydrogen ion concentration was high while other bacteria were found only when the reaction of the specimen was definitely acid and the hydrogen ion concentration was low. The physiological chemist and the bacteriologist working together have determined that some bacteria grow best in acid urine while others grow best in alkaline urine. Following this observation the urologist has been able to control, and sometimes eradicate, the growth of bacteria in the urine by changing the pH and the reaction of the urine by the oral administration of drugs and foods. Examples of the drugs used are mandelic acid, its various chemical combinations, and ammonium chloride and nitrate. The ketogenic diet, when properly composed by the dietitian and carefully followed by the patient, will produce physical changes in the urine that are bacteriostatic and sometimes bactericidal to most strains of colon bacilli. The production of a high pH of the urine so that it is very alkaline will cause bacteriostasis of the coccus group of bacteria, with some exceptions.

For many years all physicians used hexamethylenamine when any type of renal infection was present. The efficiency of this drug was improved when the pH of the urine was sufficiently changed to the acid side. This change in physical properties of the urine when hexamethylenamine is being used produced a breaking up of the chemical composition of this drug so that formaldehyde is free in the urine. This is the part of the drug that produces bactericidal action.

During the years that these observations were being made many urinary antiseptic drugs were manufactured, many of them from the coal tar dyes. The efficiency of these was based upon their effect on bacteria in a test tube. The clinical trials to determine the efficiency of these drugs as bactericidal agents acting in the tissues and fluids of the human body were and are disappointing. Occasional brilliant results were obtained but their mode of action is not well understood and the results obtained are not satisfactory.

When drugs were not completely effective some success was obtained in the treatment of severe renal infections when mild "shock therapy" was used. The stimulation of the reticulo-endothelial system produced severe reactions and a few fatalities were reported, but this type of therapy did remove bacteria from the tissues of the kidneys and from the urine. Killed bacteria, particularly the typhoid bacillus, were and are being used for this purpose.

Chemotherapy in the form of the sulfonamide drugs constitutes the greatest advance that has been made in the treatment of renal infections. These drugs can be absorbed in sufficient concentration in the blood serum so that they control the foci that may constantly or intermittently infect the kidneys via the blood stream and in addition their accumulation and elimination in the urine is a factor that makes them ideal urinary antiseptics. Careful checks of the drug concentration in the blood serum and the urine provide a method of determining correct and efficient dosage and the chemical changes that may occur in the human body that make these drugs inert in certain individuals. Although the sulfa drugs are the best agents we now have for combating renal infections, the best results following their use will be obtained only if the physician knows how to use them. Volumes have been written regarding the chemotherapeutic uses of the sulfa drugs. The subject is a complex one and the clinical use of these drugs by the uninformed, inexperienced clinician may do harm when good was intended.

Beginning at about the time that Minnesota Medicine appeared on the horizon of medical publications, I became interested in the diagnosis and treatment of lesions of tuberculosis that were found in the urogenital tract. At the same time I was offered an opportunity to study tuberculosis at Glen Lake, the County Sanatorium for Hennepin County. Since my return from the last war, I have continuously carried on a clinical research at Glen Lake Sanatorium, which I believe has added something to the information that we then had concerning urogenital tuberculosis. The method of treating renal tuberculosis today is much different from that prescribed twenty-five years ago. The first bit of information that we obtained from our clinical research was and is that lesions of tuberculosis in the urogenital tract are local manifestations of a general disease. The disease tuberculosis starts in the chest cavity, most often in the lung, where the primary lesions are located. From here, spread of the disease occurs via the thoracic duct and then the blood

stream. When spread occurs in this manner, we have a generalized disease because bacteria or infected emboli may be carried by the blood stream to any organ or tissue in the body. When this fact was thoroughly established in our minds, we realized that lesions of tuberculosis found in the kidney or other urogenital organs must be tiny to begin with and do not all progress to destruction of the kidney and crippling of other urogenital organs.

When we realized that tuberculosis of the kidneys was a secondary lesion, a local manifestation of a general disease, and that infection may be present in the kidneys for a long period of time before symptoms are produced, our next step was to determine how many individuals who had pulmonary tuberculosis had clinical evidence of urogenital lesions. This led us to the routine examination of the urine of every patient in the Sanatorium who had an active lesion of tuberculosis. This examination revealed that 4.1 per cent of all patients with pulmonary or other lesions of tuberculosis had bacilli of tuberculosis in their urines or other clinical findings of this infection in the kidneys. The urological examination of patients who had cellular elements or bacilli of tuberculosis in their urines revealed that many had demonstrable small lesions in their kidneys that could be visualized on the pyelo-ureterograms without objective symptoms suggesting the presence of renal lesions of tuberculosis.

As our clinical research progressed, we began special pathological examinations of the material obtained at autopsy and following the surgical removal of kidneys. In addition, we began the examination of the viscera of a large number of guinea pigs that had been injected with the human strain of bacilli of tuberculosis. At about the time this part of our research was undertaken, Dr. E. M. Medlar published his observations concerning the pathology of tuberculosis of the kidney. This work established the fact that renal tuberculosis was hematogenous in origin and practically always bilateral and that certain lesions in the kidney might heal and that small lesions of tuberculosis could be present in the kidney without producing symptoms.

In 1917, tuberculosis of the kidney was not suspected until the patient had symptoms of bladder involvement such as frequency, painful or burning urination. Little or no attention was paid to the general condition of the patient, and all patients were submitted to surgical treatment unless active pulmonary lesions were present.

We are learning new things each day from our continued clinical research. We believe, however, that definite progress has been made in the diagnosis and treatment of renal tuberculosis during the last twenty-five years. I am quoting herein the conclusions that I published in an article written for the International Congress of Urology. These contain some statements that suggest the advances that have been made in the diagnosis and treatment of renal tuberculosis.

"There is an early as well as a late stage of renal tuberculosis just as there is in any other type of tuberculous infection. This period may be symptomless, but a careful search will reveal clinical findings that are sufficient for a diagnosis.

"A study of the early lesions of renal tuberculosis must be undertaken while the patient is under treatment in a sanatorium. It is during the active stage of the original pulmonary or other lesions of tuberculosis that the kidney becomes infected and the early lesions develop.

"Any patient with pulmonary or other lesions of tuberculosis may have an unrecognized renal involvement (4.1 per cent in our series of cases). Repeated urinalyses, the injection of urinary sediment into animals, and complete urological studies should be made before a negative diagnosis is given.

"The route of spread of bacilli of tuberculosis from the chest cavity to the kidney is via the blood stream.

"A normal kidney does not eliminate bacilli of tuberculosis.

"The local renal lesion produced by bacilli of tuberculosis is not a local disease but a local manifestation of a general disease.

"The organs and tissues of the human body may develop resistance against the bacillus of tuberculosis that may be manifest in the kidney as well as elsewhere.

"The progress of lesions of tuberculosis of the kidney as well as elsewhere is slow.

"Tuberculosis of the kidney does not present a pathological picture different from tuberculosis of other organs. When one studies tuberculosis of other organs or tissues, this fact becomes apparent.

"Bilateral renal infection occurs in between 47-51 per cent of all patients who have urogenital tuberculosis (60-70 per cent during the invasion stage). Repeated examinations including bilateral pyelo-ureterograms are necessary to prove the absence of nondestructive tuberculous lesions in an apparently sound kidney.

"The primary focus of tuberculosis in the urogenital tract is most often the kidney. Early urogenital tuberculosis is usually a symptomless disease.

"Pyelo-ureterograms may show definite evidence of a pathological lesion in a kidney when the examination of the urine for bacilli of tuberculosis from this kidney is negative.

"Bilateral pyelo-ureterograms are major factors in

making a positive diagnosis of renal tuberculosis in 27 per cent of instances. They are valuable in following the progress of destructive lesions.

"The finding of bacilli of tuberculosis in catheterized ureteral urine from one kidney does not in itself constitute an indication for nephrectomy even if the urine from the other kidney is negative.

"Treatment for every case of renal tuberculosis is both medical and surgical. How long the medical treatment should be instituted before surgical treatment is started depends entirely upon the condition present and the care with which the diagnosis has been made.

"Clinical and pyelographic evidence indicates that a nondestructive lesion of renal tuberculosis will heal. A patient with this type of lesion should have the advantage of sanatorium treatment to assist him in building up the necessary resistance against the destructive effect of the bacillus of tuberculosis.

"Before attempting the removal of one kidney known to contain a lesion of tuberculosis, be sure that the other kidney is sound and other lesions of tuberculosis are arrested. This may require months of observation and repeated animal inoculations of urinary sediment.

"Every patient who has submitted himself for surgical removal of a tuberculous kidney should have medical treatment following the surgical operation.

"The prevalence of renal tuberculosis is decreasing.

"The character of lesions of renal tuberculosis is changing."

During our investigation at Glen Lake Sanatorium, which was aimed primarily at the diagnoses and treatment of lesions in the kidney, it became necessary to examine the whole urogenital tract. A review of the data found in the reports of complete urological examinations and careful clinical examination and observation of our patients who had lesions in the genital tract changed some of the opinions that had been expressed by other observers concerning the route of invasion and the route of spread of tuberculosis to and in the urogenital tract.

In a paper published in Minnesota Medicine in May, 1940, we listed the following conclusions. Although some of these are not accepted by urologists generally, our continued observations support these conclusions.

"Tuberculosis of the genital tract is a local manifestation of a general disease and lesions here are most often secondary to a primary urinary tract infection in the kidney. The treatment plan of the local genital lesion or lesions must be based on this pathological fact.

"The route of spread from the kidney to the genital tract is most often via the urine.

"The primary lesion in the genital tract is most often the prostate gland. From here the infection may spread to the other genital organs. Foci of tuberculosis in the prostate gland may produce no symptoms.

"The seminal vesicle is infrequently infected with the bacilli of tuberculosis and is most always associated with lesions of tuberculosis in the prostate gland.

"Tuberculosis infection in the epididymis is secondary in the genital tract to tuberculosis in the prostate gland. There may be a subacute stage of tuberculosis of the epididymis which is activated by trauma.

"Treatment of lesions of tuberculosis in the genital tract consists of:

(a) The location and arrest of other lesions of tuberculosis and of the primary focus in the urinary tract by whatever means are necessary.

(b) Hygienic treatment of lesions of tuberculosis in the epididymis and heliotherapy to be followed by application of heat, incision and drainage, and surgical removal when indicated.

(c) Orchidectomy is rarely necessary.

(d) Hygienic treatment for tuberculosis of the prostate gland and seminal vesicles after removal or arrest of other active foci in the urogenital tract is always practiced. Surgical removal of these organs is seldom necessary.

(e) Postoperative rest for three months is always essential."

One of the early articles published in Minnesota Medicine was concerned with the diagnosis and the treatment of hypertrophy of the prostate gland. This was written by a general practitioner in 1917 and was an excellent article. The author of this article asked that practitioners prepare their patients for surgical treatment by complete and prolonged drainage of the urinary bladder before they submitted them for surgical treatment for hypertrophy of the prostate gland. This writer did not discuss the merits or demerits of one or the other methods of surgical removal of the gland.

The progress that has been made in the treatment of this condition during these twenty-five years constitutes one of the most important contributions in the field of surgery. The first important forward step that was taken toward reduction of morbidity and mortality in the treatment of patients with prostate gland hypertrophy was the careful pre-operative appraisal of the patient's physical condition, particularly the function of the kidneys, heart muscle and vascular system. This was followed by the careful preoperative preparation of patients preceding surgical treatment. This consisted primarily of drainage of the urinary tract via the bladder. Mortality and morbidity rates were reduced from approximately 25 to 5 per cent or less when urological surgeons began to apply pre-operative preparation.

At this time there was still a lively controversy between the apostles of perineal and suprapubic postatectomy. The pre-operative care, however, affected the mortality equally when one or the other of these surgical treatments was applied.

After the mortality rate associated with prostatic hypertrophy was reduced below 5 per cent, the makers of surgical instruments of precision for inspection of the bladder, added parts to these instruments so that transurethral resection of the prostate gland might be accomplished. Many different kinds of instruments were used and these were divided into two main groups: those that used a wire loop or round knife activated by means of a high voltage electrical current that would produce cutting in water, and those that used a round coring type of sharp steel knife that would remove sections of tissue when they were engaged in a fenestrum near the end of the sheath of the instrument. The currents used for cutting under water have been constantly improved and the instruments for using the activated loop have been so improved that the partial or complete removal of the prostate gland by this route has become the method of choice in the hands of many urologists.

Some conservative urologists who watched the constant lowering of the morbidity and mortality rates which occurred with improvement in the technique of pre-operative care of these patients, still adhere to the open method of surgical removal. They find certain types of enlargement and many patients whose general physical condition suggests that in their hands the patient would be more safely handled by open surgical removal. Most urologists have fitted the transurethral method of removing the prostate gland into their armamentarium, but do not remove all prostate glands in this way. Some urologists have so thoroughly mastered the technique of transurethral resection that all prostate gland hypertrophies are removed by them in this manner.

The transurethral or resection method has become the method of choice for removing the obstruction at the bladder neck associated with malignant changes in the prostate gland. There is no doubt that transurethral resection has permitted many patients to live in comfort and urinate near normally for many more years than would have been their lot had a suprapubic drain been introduced and the prostate gland received no treatment.

A urologist has recently proved the relationship between malignant growths in the prostate gland and the gonads in the male. The use of male anti-gonad, or female gonad, or like chemical substances has controlled the progress of malignant growths in the prostate gland, has reduced the size of the metastatic growths, has improved the general condition of most patients and in many instances has relieved them of distressing pain, especially that from metastases that have involved the bones of the spine, the pelvis and the adjoining nerves. This gonad substance may be given by mouth.

Brilliant results have been obtained following the surgical removal of both testicles in the relief of pain produced by multiple metastases. Bilateral orchidectomy produces a break in the gonad control of and the stimulating effect on the growth of certain cells found in all malignancies of the prostate gland that are gonad related.

The biochemists have isolated an enzyme that may be elaborated by gonad-related malignant cells that occur in the prostate gland and in bone metastases. The amount of this enzyme in excess of normal can be determined by analysis of the blood serum. Its presence in more than normal amounts suggests bone metastases and the blood level of this enzyme furnishes a gauge of the growth increase or recession of these metastatic lesions.

This advance in the treatment of carcinoma of the prostate gland has not produced cures of this fatal and crippling disease of older men. It has, however, produced some brilliant results in the relief of pain, improvement in the patient's general condition, and a definite change in the character of the malignant growth. If we remember that 25 to 30 per cent of all men who have symptoms of hypertrophy of the prostate gland have demonstrable malignant changes in their prostate glands, we can realize how important this advance in the treatment of this condition becomes.

Ferrets, apparently susceptible to the common cold, make good subjects for research.

PROGRESS IN ORTHOPEDIC SURGERY

MELVIN S. HENDERSON, M.D.
Rochester, Minnesota

IN the fifth to the tenth centuries, both crippled children and adults were neglected and abused; their plight was regarded as divine punishment and no sympathy or understanding was extended to them. The Renaissance slowly brought into being new thoughts and facts; social science gradually emerged into being in the seventeenth and eighteenth centuries. To her everlasting credit, England led the way in concluding that government owed something to the poor and unfortunate. At present, in our own State of Minnesota, provision for the care of the crippled child leaves little to be desired.

Orthopedic Facilities in Minnesota

The first number of MINNESOTA MEDICINE was published in January, 1918. The first original article in that issue was written by Drs. Arthur J. Gillette and Carl C. Chatterton. It dealt with the orthopedic treatment of deformities resulting from incurable paralysis. Dr. Arthur J. Gillette, pioneer Minnesota orthopedic surgeon, was president of the Minnesota State Medical Association that same year and his presidential address was published in the October, 1918, issue of MINNESOTA MEDICINE.

The history of orthopedic progress in Minnesota is closely interwoven with the life work of Arthur J. Gillette. Soon after his entrance into the ranks of the medical profession, Dr. Gillette decided to devote himself exclusively to orthopedic surgery. True to the orthopedic surgeon's unwritten code that the crippled child is his chief charge and responsibility, Dr. Gillette labored with never-lagging energy in that child's interests; in so doing, he placed Minnesota first among the commonwealths of the United States in recognizing its duty to the frequently forlorn and neglected crippled child. As his influence and prestige increased, Dr. Gillette never forgot that obligation and he brought more pressure to bear on his friends in the legislative body of the state to provide better care and educational facilities for the crippled child.

As early as 1897, Dr. Gillette appeared before the legislators of the state appealing for state aid for the crippled child. Because of this appeal to the hearts of these men, and because they were swayed by the deep sincerity and earnestness of Dr. Gillette, he succeeded in awakening an interest in the problem of the indigent crippled child which has become traditional in that body and has never faded. There was no real precedent for this action and the legislators were treading on pioneer ground. In 1907, a grant was made to build a hospital for these children. The building was completed in 1911 and the children were transferred from the state owned ward at the City and County Hospital of Saint Paul (now Ancker Hospital) to their new home, the Minnesota State Hospital for Crippled and Indigent Children, located at Phalen Park. Dr. Gillette was the surgeon in charge until his far too early death on March 24, 1921, when he was but fifty-seven years of age. Soon after his death, the legislative body of the state changed the name of the hospital to The Gillette State Hospital for Crippled Children—a worthy tribute to its founder. Later was added Michael J. Dowling Memorial Hall, of which I shall say more later. The hospital is a comfortable, serviceable building of the one-story, pavilion type and is under the superintendency of Miss Elizabeth MacGregor. Dr. C. C. Chatterton is now the surgeon in charge. The hospital accommodates more than 250 patients, who receive the best services known to medicine and surgery.

The Shriners' Hospital for Crippled Children was built and opened in Minneapolis in 1923, on East River Road, adjacent to the Saint Paul city limits. Dr. Wallace Cole has been chief surgeon there since the founding of the hospital. This project reflects great credit on the "playground of Masonry," the Order of the Mystic Shrine; it supplies concrete evidence of an increased appreciation among men that social obligation must be recognized and met.

By the early and middle twenties the number of surgeons in Minnesota confining their work to orthopedic surgery gradually had increased. On September 30, 1924, at the home of Dr. Emil Geist, who died in 1933, the Minnesota Ortho-

From the Section on Orthopedic Surgery, The Mayo Clinic, Rochester, Minnesota.

pedic Club was organized with Dr. Geist as its first president. Its purpose was to furnish a medium through which Minnesota surgeons who were interested in orthopedic surgery might exchange ideas. The members recognized their responsibilities to the public and provided physicians to conduct clinics, which were being organized about the state, to bring to light the crippled and arrange for their care. In 1934 the membership was opened to include orthopedic surgeons from the Dakotas and the name of the organization was changed to the Minnesota-Dakota Orthopedic Club.

In 1928 a significant event bearing on orthopedic surgery occurred at the University of Minnesota. Folwell said it was an event illustrative of "how a university whose primary function is to enlarge knowledge, including that of laws of health and the means of healing diseases may become the custodian and trustee of private endowments for charity." This statement was in reference to William Henry Eustis' gift of $2,000,000 for the establishment of the "Minnesota Hospital and Home for Crippled Children."

A peep behind the curtain into the life of the donor is interesting. Born in New York State in 1847 of English lineage, William Henry Eustis, at the age of fifteen years was afflicted with disease of the hip joint and became crippled for life. However, his spirit was undaunted; he pursued his education, graduated in law and came to Minnesota in 1881 to practice. Later he was mayor of Minneapolis and he dealt so successfully in real estate that he amassed a fortune. His own affliction led to his deep understanding of the handicapped, crippled child. He never married, had no heirs or close kin and his lot must have been, in many ways, a lonely one. He decided to do all he could for crippled children and his magnanimous gift was the result.

November 10, 1928, the cornerstone of the Minnesota Hospital for Crippled Children was laid. Dr. Charles H. Mayo, of Rochester, was the principal speaker on this occasion and he remarked that William Henry Eustis would be honored forever, not only as a benefactor of children but also as a great contributor to education and scientific progress. "He thought," said Dr. Mayo, "of future education in Minnesota when he stipulated that this hospital, his gift to unfortunate children, should be located at the University, the center of education in the State." Unfortunately Mr. Eustis was too ill to attend the ceremony and he died a few weeks later, on Thanksgiving Day. It was not long after this that the hospital became known as the Eustis Hospital for Children instead of by the name modestly suggested by the donor. At present this hospital, which is a wing of the University Hospitals, is used chiefly for teaching pediatrics—the words "crippled children," used in the original name of the hospital being employed in the broadest sense. This hospital, together with the facilities at the Gillette and Shriners' Hospitals, provides ample beds for both undergraduate and graduate teaching.

A few years previous to the time when Mr. Eustis made his gift to the University of Minnesota, he had turned over twenty-one acres of land on West River Road for the erection of the Michael J. Dowling school which was to be devoted to the care and education of crippled children. Public subscription of $50,000 to this fund, and a like contribution made by the legislature, provided funds for erection of the building. It is maintained as part of the educational system of the city of Minneapolis.

Michael J. Dowling's name is used for two institutions in Minnesota: the school at the Gillette Hospital and the school for handicapped children in Minneapolis. Mr. Dowling had a colorful and successful career—an inspiration to all who are physically handicapped. When fourteen years of age, as a result of exposure in a severe blizzard in Yellow Medicine County, he lost both legs, one arm and part of the other hand. Undaunted he fought for an education and later owned, managed and edited a newspaper; following that he became a successful banker at Olivia, Minnesota. Mr. Dowling was elected to the legislature and became speaker of the House of Representatives. Following the war of 1914-1918 Mr. Dowling visited hospitals in both England and the United States, demonstrating what a man could do without limbs.

Graduate Training.—Three-year fellowships for graduate training in orthopedic surgery are maintained at the University Graduate School of Medicine in Minneapolis and also at the Mayo Foundation in Rochester. At the termination of this period of training, when a thesis has been written and accepted, and the fellow has successfully completed written and oral examinations,

he receives his M.S. degree in orthopedic surgery. In the course of this three-year fellowship, each graduate student in orthopedic surgery in residence at the Mayo Foundation spends six months at Gillette State Hospital to obtain intensive training in the treatment of crippled children. In like manner, those fellows in residence at the University Graduate School of Medicine, in Minneapolis, come to the Mayo Foundation for six months or a year, for training in orthopedic diagnosis, particularly as applied to adults. A fellowship at the University of Minnesota is maintained through the gift of funds by the late Mr. and Mrs. H. S. Cole, parents of Dr. Wallace H. Cole.

In 1934, through the coöperation of the Section on Orthopedic Surgery of the American Medical Association, the American Orthopaedic Association and the American Academy of Orthopaedic Surgeons, the American Board of Orthopaedic Surgery, Inc., was organized. The purpose of the American Board of Orthopaedic Surgery is to improve the practice of orthopedic surgery by establishing certain standards of training and achievement which must be attained by candidates before they are declared diplomates of that board. Such a board has no legal right to prevent the practice of orthopedic surgery by physicians who are not diplomates of the board, but by its moral influence it has been a definite aid in keeping the practice of orthopedic surgery on a high plane. At the present time Minnesota has fourteen diplomates of the American Board of Orthopaedic Surgery, Inc., who are practicing in the state. Other specialties have similar boards and all are joined together in an advisory board of medical specialties.

Social Science in Orthopedic Surgery.—In 1935 the National Security Act, a recognized advance in social science, was passed and the responsibility for administration of the federal funds provided for crippled children was placed in the Children's Bureau of the United States Department of Labor. In 1936 the Division of Services for Crippled Children under the Minnesota State Board of Control was organized to administer the funds appropriated in Minnesota as an extension of existing services under the National Security Act. Gillette State Hospital, Eustis Hospital of the University and Shriners' Hospital were providing hospital services but adequate follow-up services were lacking. Dr. Herman E. Hilleboe was appointed director and a system of follow-up and diagnostic clinics was organized about the state. When the hospitals above mentioned were overcrowded and a long waiting list existed, the bureau made arrangements for care of these waiting patients in hospitals in the Twin Cities, Duluth and Rochester, which had orthopedic surgeons on their staffs. In 1939 the Board of Control was eliminated by legislative action and its functions were assumed by the Department of Social Security of the State of Minnesota. The Division of Services for Crippled Children was then set up as a bureau in the medical unit of the Division of Social Welfare of the Department of Social Security and, as such, carries on today. It is functioning effectively now under the direction of Dr. Malvin J. Nydahl. The age limit of the crippled child treated under this plan has been raised to twenty-one years.

After the orthopedic surgeon has done everything possible for the cripple, he is usually requested to suggest some means by which the handicapped person can take his place in society and earn his own way. This raises the question of vocational adjustment and, by 1939, under the Social Security Act, assistance of this kind had been established in all forty-eight states, as well as in the Territories of Hawaii and Puerto Rico. Direct responsibility for the program is assigned to the State Boards of Vocational Education. To be eligible in Minnesota the applicant must be a resident of the state, sixteen years of age or older and have a permanent physical disability which results in a vocational handicap.

Thus we see that during the past twenty-five years Minnesota has lived up to her early history of interest in the care of indigent, crippled children and has provisions second to none for their welfare. We have every reason to be proud of this achievement.

Now what has orthopedic surgery contributed in twenty-five years to the campaigns against particular diseases?

The Orthopedic Attack on Certain Diseases

Tuberculosis.—In twenty-five years, the change in manner of practice of orthopedic surgery, and in the character and number of patients accepted for treatment, perhaps has been most outstand-

ing in tuberculosis. The wards of orthopedic hospitals were formerly well filled with patients afflicted with tuberculosis of the bones and joints. At present, these cases are so rare that instructors in teaching institutions experience difficulty in finding patients to present to their students. We see less tuberculosis of all types; the sanatoriums of the country are no longer filled with patients with pulmonary tuberculosis; tuberculous glands of the neck are very seldom encountered and tuberculous peritonitis is very rare. The chief reasons are that better living conditions exist and open tuberculosis is recognized earlier; the dairy herds have been rid of the tuberculous cow and the milk in most towns and cities must be pasteurized. In private practice among orthopedic surgeons, very few patients with tuberculous joints are seen.

Poliomyelitis.—Infantile paralysis still takes its toll but in Minnesota during recent years the disease has not been attended by the high death rate it carried in some earlier epidemics. Comparison of the end results of treatment of this disease is very difficult because of the great variation in the types and degrees of paralysis in different epidemics. Since President Roosevelt allowed his name to be used, and the date of his birthday to be set aside as the occasion for raising funds to make possible research into the causes, effects and treatment of infantile paralysis, large sums have been accumulated. These funds have been too large to be used advantageously in research alone, so a large portion is left in the hands of local committees to be utilized in the care of persons afflicted with this disease.

There appeared on the scene in America a crusader from Australia with her own theories about the manner of treating patients afflicted with infantile paralysis. At first Miss Kenny (called Sister Kenny because all Australian nurses are given that title) was not understood but, undaunted and convinced of the value of the treatment, she continued her travel and finally came to Minnesota with a letter of introduction to the author. I had known of her work through friends in Australia and some of them, who formerly would not accept her theory, had reversed their opinions and they wrote, stating they were convinced of the value of her method and urging that her work be given thorough trial in America. Very few patients with acute infantile paralysis are seen in Rochester and that was the type of patient Sister Kenny wished to treat and so demonstrate her method. My appeal to Dr. Wallace Cole to give Sister Kenny a hearing was granted and very shortly thereafter provisions were made by Drs. Cole and Knapp for Sister Kenny to begin her work at the University.

Previous to this time, little or no treatment usually was administered during the acute stages of infantile paralysis. Often serums, including human serum, were used but it was difficult to evaluate the results. Immediately following the patient's admission, Sister Kenny boldly treated the patients, irrespective of the degree of illness or pain. She systematically applied warm moist packs and she employed no splints or massage. Pain and spasm were relieved with astonishing promptness. If for no other reason than the relief of pain, Sister Kenny's method was an advance in the treatment of infantile paralysis. When the doubting ones examined the patients treated by Sister Kenny, for the early deformities occasionally encountered in this disease, they were not to be found. The Kenny method is established. Sister Kenny always has conducted her work under the supervision of the medical profession and she never has accepted for herself a fee for services. There can be no doubt of the integrity and honor of this public-spirited woman and Minnesota owes her a debt of gratitude. Sister Kenny, in return, freely acknowledges her debt to the National Foundation for Infantile Paralysis, the University of Minnesota, the city of Minneapolis and its public-spirited citizens. She is appreciative of the efforts of the men associated with her in Minneapolis, particularly of their scientific aid in attempting to clarify the terms she used and to explain the spasm in the affected muscles and other changes which she noted in the acute stages. The Center for Continuation Study at the University of Minnesota has arranged courses of instruction in the Kenny method and orthopedic surgeons, physical therapists and physical therapy technicians have come from all over the United States and Canada to attend these classes. Minnesota has taken the lead in this phase of orthopedic teaching.

Osteomyelitis.—A dread disease which frequently affects children is osteomyelitis. Teaching concerning its treatment has been modified. Formerly it was regarded as a primary disease of bone whereas very often the involvement of bone

is but an incident of general septicemia. Radical surgical treatment, by which a bone was opened wide to locate a small focus, frequently resulted in spreading the disease, and death. Many years ago a young orthopedic surgeon boldly challenged his chief's radical methods by putting his patients in casts and at rest and, strangely enough, his results were excellent and fewer children died. Sad to say, however, it cost him his position on the staff of that hospital. Now it is generally recognized that in these cases surgical methods must be very conservative. If operation is carried out, provision should be made for wide drainage by a vaseline pack and fixation in a cast, according to the method of H. Winnett Orr of Lincoln, Nebraska. In chronic cases, the same method is used but it must be preceded by meticulous surgical care in that all sequestra, infected pockets and sinuses must be cleaned thoroughly.

Sulfonamides were introduced into this country about 1937 and since that time they have been used extensively for many conditions including osteomyelitis. Prontosil was the first drug in this line to be used in this country; then came sulfanilamide, sulfathiazole, sulfadiazine and others. Sulfanilamide is considered the most effective in the treatment of streptococcic infections while sulfathiazole is thought best for staphylococcic infections. These drugs are not particularly effective after suppuration has become extensive. Undoubtedly, however, many lives have been saved in those cases in which the blood cultures have been positive. Last winter, for the first time, I saw an adult patient recover from staphylococcic septicemia complicated by osteomyelitis of the femur. I am confident sulfathiazole saved his life.

Ununited Fractures.—Orthopedic surgeons are called on to treat ununited fractures. Frequently such fractures are compound and infection has taken place—the result of severe, crushing types of trauma. After long months of waiting for the infection to subside (frequently a year or more after all drainage has ceased) a bone grafting operation may be undertaken. Although the technical steps of the operation may be adequately carried out, the old infection may flare up and the work be lost. Sulfonamides have enabled us to perform these hazardous operations with a much lower rate of infection. Before operation, the patient is given the drug by mouth until the concentration of the drug in the blood is at the desired point; before the wound is closed at the completion of the operation the surface of all tissues is covered carefully with a thin layer of the sterilized, powdered drug that has been selected. After surgical operation, the concentration of the drug in the blood should be observed for at least a week to insure maintenance of an adequate concentration. Administration of these drugs is not without peril; patients with injured kidneys do not tolerate them well and, if the leukocyte count goes much below normal, administration of the drug should be discontinued. There is no doubt of their value in the treatment of infected wounds of all types but sound surgery should at all times be the master of the situation.

The Recent Past and the Future Need

Twenty-five years is a quarter of a century and during that span of time many changes occur and much progress is made. Other conditions in the field of orthopedic surgery have improved but they are too numerous to be mentioned at this time.

Social advances have been made in care of the crippled child but we are still found wanting in similar care of the adult. The handicapped person now has the opportunity of training for a line of work which will enable him to be self-supporting. Changes, as mentioned, occur in the type and frequency of certain diseases. What the world needs more than anything else at present is a type of mental hygiene which will sweep aside and segregate the evil-mindedness of such men as Hitler, Mussolini, Hirohito and their ilk. Only thus can be prevented such world catastrophes as we are now experiencing. Let us pray that the next twenty-five years will see this accomplished.

References

1. Folwell, W. W.: A history of Minnesota. Saint Paul; Minnesota, Historical Society, Volume 6; 122, 1930.
2. Gillette, A. J., and Chatterton, C. C.: The orthopedic treatment of deformities resulting from incurable paralysis. Minnesota Med., 1:1-5, (Jan.) 1918.

A method of producing lactic acid from grapefruit juice, using discarded fruit, has been patented by two chemists of the U. S. Department of Agriculture.

THE PROGRESS OF OBSTETRICS DURING THE PAST TWENTY-FIVE YEARS

W. A. COVENTRY, M.D.
Duluth, Minnesota

A REVIEW of the progress of obstetrics in Minnesota during the past twenty-five years is best revealed by the very marked decrease in maternal and fetal death rates during that period.

Thus it will be seen that Minnesota has for twenty-five years had a favorable maternal death rate as compared to the national rate. It also shows that the rate today is one of the lowest, if not the lowest, of any state in the Union.

MATERNAL DEATH RATE

Year	*Minnesota*	*U. S. Bureau Rate Average of All States*
1915	5.2	6.1
1920	6.2	8.0
1925	5.2	6.5
1930	5.4	6.7
1935	4.7	5.8
1940	2.2	3.7
1941	2.0	Not available

This most favorable report has not just happened. It is the result of many factors, largely brought about by, first, a program of education fostered by the Children's Bureau at Washington, by the efforts of the State Board of Health and our own teachers in the University of Minnesota, and last, but not least, by the untiring efforts of the obstetricians of this state who have campaigned in many and devious, but arduous ways, to make studies of the main causes of maternal deaths, and set out to teach and preach how these difficulties may be overcome.

The main causes of maternal death fall under four main headings: hemorrhage, sepsis, toxemias, and a miscellaneous group. In the prevention of hemorrhage, there has been less progress made than for any other cause, largely because there are so many extrinsic factors involved. The rate in Minnesota for maternal deaths from hemorrhage has not decreased, while from sepsis the rate has fallen from 1.8 in 1922 to 0.53 in 1940. In toxemic conditions, the rate fell from 1.10 per cent to 0.47 per cent in a corresponding period of time and in the group of miscellaneous causes, a decrease of 66 per cent is noted, showing a much better rate in Minnesota than in the United States at large.

Probably one of the greatest advances in maternity during the past twenty-five years has been the persistent stressing of and insistence on prenatal care, such prenatal care to begin as soon as possible after conception. So great have been the results from this campaign that now it is a rarity to find a pregnant patient who is not under the observation of a physician throughout her entire pregnancy and a rarity to find a physician in this state who does not insist on prenatal care for at least the essentials of a complete physical examination including a Wassermann and pelvic measurements followed by monthly or semimonthly examination of urine, blood pressure, blood, and the weight of the patient. Not only have these examinations been of inestimable value to the patient, but they have made the physician more alert and more eager to diagnose impending dangers of hemorrhage, malposition, toxemia, severe anemia, et cetera, which when early discovered make it possible to do much to avert impending trouble for mother and fetus.

Twenty-five years ago sepsis accounted for more maternal deaths than any other one cause. Now it is at the bottom of the list. The advent of the gloved hand, the disapproval of vaginal examination under any than the most careful aseptic technique, and the great increase in the number of hospitalized obstetrical patients, all have been a great help in lowering this rate. The advent of finger rectal examinations during the progress of labor makes it a rarity to do a vaginal during this stage of labor. The free use of soap and water has been a great help. Much has been done during the past twenty-five years toward the use of vaginal antiseptics. All types of germicides have been advocated and used. The relative merits of the various antiseptics leaves room for much discussion, but, in any event, it has taught the obstetrician to respect the possibilities of infection via the vaginal route.

I believe the lowered incidence of, and the education directed toward prevention and cure

From the Department of Surgery, Gynecology and Obstetrics, The Duluth Clinic, Duluth, Minnesota.

of venereal diseases during these twenty-five years has had much to do in the prevention of puerperal sepsis. A postpartum neisserian pelvic infection has almost disappeared from the picture.

Toxemic conditions have decreased 60 per cent during the past twenty-five years, as the result of much intensive investigation in the world's obstetrical centers and the teachings of our schools. Incorporated in the value of prenatal examinations is the early recognition and differentiation of nephritic conditions from true toxemic conditions and eclampsia, the interpretation of the value of urine tests, examination of eyegrounds, blood pressure levels, edema, and weight increases, especially in the later months of pregnancy, and the determination of avenues of treatment not only to save the baby, but also to prevent damage to the mother's kidneys, blood vessels and liver that might otherwise result in permanent insult to these organs. Although future investigations will undoubtedly clear up many of the theories now advanced as to the causes of toxemia, there is at present much to be learned for future generations.

This progress made in the lowering and prevention of maternal deaths has also had a most favorable effect on the lowering of the fetal death rate both stillborn and newborn.

It might be well to review a few of the new methods of treatment of the obstetrical patient that have come to stay or the old ones that have gone for good during the past twenty-five years. These remarks may have a personal slant, but take them for what you think they are worth.

1. In considering measures to alleviate pain during labor, the barbiturates should receive chief mention. Such a wave of enthusiasm, never, in my humble opinion, has entered the obstetrical field in a given time as in the era of barbiturates for the relief of labor pains or for "painless labor." The number of drugs and their method of use, their sane and insane use, the effects upon mother and newborn, the necessity for hospital care and nurses to properly supervise these medications—well, volumes have been written by all kinds of enthusiasts, and now I think we can see the near decline of the barbiturates in the management of the first stage of labor. There are still some "old-timers," and their number is increasing, who believe that small doses of morphine properly administered can give a patient better rest than any barbiturate. There will be a reversion to the age-old fact that our forbears took no drugs at all and soon after delivery forgot that there were labor pains. There was no exhaustive lay literature for them to read and give them the impression that labor was a painless effort. Old Dame Nature, I believe, did not intend it that way.

2. Cesarean section twenty-five years ago was considered a very major operation; it was done usually as a last resort and there was a resultant high mortality rate. The improvements in surgical technique, together with a desire for surgery, I believe, caused a wave of enthusiasm for cesarean section about ten years ago, wherein there arose in the minds of some good obstetricians too many indications for this operation which still has surgical dangers. It seems to me that with the advent of more diagnostic aids in x-ray pelvimetry, more skill in the diagnosis of placenta previa, that cesarean section gradually is finding its place in rational obstetrics. The types of low cesarean section that have been developed have certainly helped in lowering the morbidity and mortality rate from this operation.

3. There have been new types of anesthesia introduced within the past twenty-five years such as rectal, spinal and many new gas anesthesias and more recently, intravenous anesthesia. Many distinct advances have been made in the administration of anesthesia which have added much to the comfort of the patient in labor. The old, but yet very good, chloroform seems to have been relegated almost to the curiosities of the delivery room. I predict that soon some type of anesthesia easily administered, without harmful effect to the baby, but still very effective in relieving pain for the mother without retarding labor, will be found.

4. New techniques in x-ray pelvimetry have made great advances in the proper interpretation of pelvic measurements and the relationship of the fetal head to the pelvic inlet. There has also been a great advance in soft x-ray technique in determining the site of the placenta in the pregnant uterus.

5. Vitamins have a decided place in obstetrics, but the age in which we live with radio, advertising, propaganda and zealous enthusiasts have made for an easily led Mr. Public. We are on the wave now, and have been for the last five years; possibly we are on the crest of the wave—who can predict? Each for himself. My pre-

diction is that on the other side of the crest of this wave such a distinct recession will occur that Mr. Average Public will gasp for breath when he finds that the millenium was just a mirage.

6. The current and increasing use of episiotomy has been a great advance in obstetrical technique. It certainly eases the second stage, shortens labor, but most of all it protects the outlet of the vagina from many future cystoceles, rectoceles and prolapses and prevents many weakened perineums. Painstaking suturing and more accurate repair of incised or torn perineal parts have insured much in the way of permanent results. Perineal injuries and their end-results are becoming more uncommon in the gynecological field.

7. Better obstetrical teaching in our medical schools and the virtual insistence on delivery by natural methods, so firmly impressed in our own medical school, have relegated the high forceps operation to a thing of the past.

8. The technique of version as so ably taught by Dr. Irving Potter of Buffalo, New York, has been an epochal advance when version is indicated. True, we cannot believe the indications are so many as advocated by the master; still, the technique is masterful.

9. The development of the field of pediatrics within the past twenty-five years and its relationship with obstetrics has been of the greatest advantage in decreasing the newborn death rate and insuring much healthier babies.

10. Much has been learned within the past twenty-five years regarding the care of the mother postpartum. The value of movements and exercise in restoring the muscular tone of not only voluntary but involuntary muscles has made for a more rapid return to involution of all organs involved in the pregnant state. The papoose days may not be so far distant.

11. The value of postnatal examinations with office repair and correction of minor postpartum complaints is being stressed and is almost a final chapter in restoring our good patient to her normal self.

All this progress during the past twenty-five years has not just happened by a process of evolution. The efforts and interest put forth by Public Health Workers, as exemplified in the federal monies furnished the State of Minnesota through the State Board of Health and the University in conjunction with willing obstetricians, have made it possible to go out to certain centers in the state and to preach and teach better obstetrical care.

This interest among obstetricians has stimulated the formation of obstetrical societies such as the Central Association of Obstetricians—the organizers being leaders in our state in obstetrical matters; the progressives, who, not for gain but for mankind and womankind, have endeavored to learn more for themselves and to pass so freely their knowledge on to others. They have organized other "within the state" groups all for the same reason—to pass on to others their knowledge about the pregnant woman.

This great University of the State of Minnesota, through its teachers and more especially the Center for Continuation Study, by bringing all those interested in obstetrical knowledge under their roof, has added its mite to advancing obstetrical knowledge.

I have endeavored to avoid personal references but I can't resist the mentioning of Dr. Jennings C. Litzenberg, emeritus Professor of Obstetrics of the University of Minnesota, for his epochal teaching of conservative, sound and sane obstetrics and his many contributions to that field during the last twenty-five years.

All the aforementioned influences—desire for knowledge, free-will offerings of services, sound teachings—have their place. The State of Minnesota is among the states in the lowest brackets of the maternal death rate of the nation.

HANDS UNIMPORTANT IN SPREAD OF "FLU"

Discovery that the influenza viruses type A and type B die in a few minutes if put on human skin, such as the palm of the hand, and allowed to dry there, was announced by Commander Albert Paul Krueger, in command of Naval Laboratory Research Unit No. 1 at the University of California.

"Virus solutions so strong that a teaspoonful would kill half a billion mice lost all disease-producing capacity within 10 minutes," Commander Krueger, formerly professor of bacteriology at the university, stated.

"These results emphasize again the importance of tiny virus-containing droplets sprayed into the air when one sneezes, coughs or even talks vigorously, as a means of spreading influenza. Hand to hand distribution of the virus and eventual hand to mouth transfer would appear to be unimportant hazards."—*Science News Letter,* December 5, 1942.

ADVANCES IN RADIOLOGY IN THE PAST QUARTER-CENTURY

R. G. ALLISON, M.D.
Minneapolis, Minnesota

RADIOLOGY has advanced more rapidly than any other branch of medicine in the past twenty-five years. This advancement first occurred in revolutionary changes in apparatus. Once these improved machines and materials were available, diagnoses began to improve by leaps and bounds.

There are perhaps two reasons for this rapid advancement which began at the time of World War I. First, the specialty itself was relatively young, but most important was the necessity for new, easily transportable and efficient x-ray apparatus for our troops in France. One has only to reflect on the gas tubes, glass plates, mechanical rectification and even mercury interruptors commonly in use at that time. War called for more efficient apparatus, and the inventors and manufacturers responded in a manner that gave us more improvements during the year 1917 than had been made in all the years since Roentgen announced his discovery.

Dr. W. D. Coolidge, who in 1912 developed the x-ray tube which bears his name, in 1917 developed a self-rectifying tube. This contribution of his made it possible for the manufacturers to develop a compact portable machine to energize this tube. This made bedside x-ray work possible and made it practical to treat fractures successfully by skeletal traction without moving the patient to obtain plates. The manufacturers utilizing this self-rectifying tube were able to construct a similar x-ray for use in the field hospitals, the source of the current being a self-contained gasoline engine. Those two types of machines did 90 per cent of the x-ray work done in the American Expeditionary Forces.

The Eastman Company, in this same summer of 1917, developed an extremely satisfactory x-ray film which gave beautiful detail, was easy to transport, develop and store, and could be transported with the wounded soldiers and their records without danger of breakage.

A few years after the World War, Dr. Hollis E. Potter of Chicago perfected the movable grid which bears his name and the name of the original inventor, Dr. Gustav Bucky. This apparatus enabled the radiologist to obtain radiographs showing beautiful detail in areas previously inaccessible owing to the secondary radiation set up in the body of the patient with consequent blurring of detail. This apparatus was the second great invention since Roentgen's time, the first being the Coolidge tube. While all of these machines and apparatus have been further improved upon, they stand today as the basis upon which all subsequent apparatus has been modeled.

The next basic invention was the planograph developed a few years ago. This apparatus, as you know, was developed in order to enable the radiologist to go after one particular area of the body and obliterate all other detail on the plate. Thus it is possible with this apparatus to show perfect detail of the sternum without the superimposed shadow of the spine, ribs and lungs. Any given portion of a vertebra can be shown without superimposed shadows of other portions of the same vertebra. Laryngeal cords and tumors can be clearly delineated. It is applicable to every portion of the body. So far its greatest value has been in diseases of the chest. Here the absence or presence of pulmonary cavity or tumor may be clearly shown even in the presence of large pleural effusions or in chronically thickened pleura which on the ordinary chest film would obscure detail of any underlying stricture.

This method is still not widely used and will not be until the end of this present war enables the manufacturers to further perfect it. However, many radiologists with the use of "homemade" apparatus have done excellent work by employing this method.

Having now mentioned these basic inventions in apparatus developed in the past twenty-five years, let us consider some of the chemical and physical media which have been brought forth as diagnostic aids and agents in the same period of time.

Dandy of Johns Hopkins, in 1918, developed ventriculography. This has done much to clarify the diagnosis of intracranial new growths as well as to help to differentiate them from the early and late effects of traumatic lesions.

Forestier of France, in 1922, developed lipiodol. This oil can be safely introduced into the bron-

chi, the uterus, the nasal accessory sinuses, and the spinal canal. The diagnosis of pathological conditions in these areas has been made infinitely easier and more accurate by the use of this oil. It is the only method by which prolapsed inter-vertebral disc can be visualized and localized. After the diagnosis has been made the oil can then all be withdrawn through the same needle through which it was introduced.

Cole and Graham of St. Louis, in 1924, developed a gall-bladder dye which has made the diagnosis of pathologically functioning gall bladders, with or without stones, extremely accurate.

Swick, in 1928, developed an intravenous kidney dye which has proven to be an outstanding agent in the diagnosis of injuries and diseases of the urinary system. By the use of this method the urologist has been able to avoid much cystoscopy. He has further been able to obtain much information not obtainable by retrograde pyelograms. This method is invaluable in the diagnosis of hydronephrosis. By its use non-opaque stones can be recognized with a high degree of accuracy. Opaque stones can be localized and differentiated from other conditions casting similar shadows on the routine plate. Used in connection with cystoscopy and retrograde pyelograms it should leave few diseases of the urinary tract undiagnosed. It is by far the most valuable and often the only method of recognizing some of the congenital abnormalities of the urinary tract.

Diseases of the Chest

Although as early as 1906 Williams of Boston had written extensively on the fluoroscopic diagnosis of cardiac and pulmonary lesions, his work attracted little attention.

Lewis Gregory Cole of New York City had, as early as 1907, made a plea for the use of x-ray plates in the diagnosis of tuberculosis. Again, in 1910, he classified the changes produced by pulmonary tuberculosis on the x-ray plates. His information had been obtained in the morgue at Bellevue Hospital. Here he radiographed hundreds of chests post mortem and correlated his findings on the plate with the autopsy findings.

In 1911, Kenyon Dunham of Cincinnati carried the work of Cole still further with serial microscopic section studies of both normal and pathological lungs. Dr. Cole and Dr. Dunham, by 1912, had interested the Saranac Lake men in the x-ray diagnosis of chest conditions. It was my privilege to enter on my two-year service in 1912 simultaneously with the advent of their first x-ray machine. Even the enthusiasm of the Saranac staff made little impression upon the world at large. Many inquiring workers, however, came to Saranac in those early years between 1912 and 1917 and became converts to the x-ray method of diagnosis.

When World War I began for us in 1917, Dr. Cole and Dr. Lawrason Brown made many futile attempts to interest the Surgeon General's office in obtaining a single chest plate of each army recruit. When this was refused they obtained funds from the health department of New York State and made stereoscopic plates of a National Guard Regiment in New York City. They found 10 per cent of the 2,000 men examined to have definite parenchymal tuberculosis. Even with these published facts the Surgeon General's office refused to do anything further in regard to x-raying the chests of recruits. I might add, however, that the Surgeon General's office was guided in their decision by the advice of both civilian radiologists and civilian internists who still felt the method was without value. It was not until the several hundred young radiologists who were trained in the army School of Radiology began to make their influence felt that the x-ray diagnosis of tuberculosis began to be generally accepted. The influenza epidemic of 1918 furnished a fruitful field for their endeavors. The portable bedside x-ray machine invented that year made routine plates easy to obtain. The radiologists found ardent allies in the pathologists during this epidemic and gradually the value of this method began to be forced down the throats of the ward surgeons and physicians. When the war ended the x-ray diagnosis of tuberculosis was at last firmly established twelve years after Cole had written his first article on the subject based on a comparison of post mortem x-ray findings as compared with autopsy findings.

I regret that Lawrason Brown did not live to see his stand in 1917 vindicated. It must be a source of satisfaction to Dr. Cole to see his recommendation to the Surgeon General of the army accepted in full twenty-five years later.

The late Willis Manges of Philadelphia, in 1922, made a classic observation in his description of the x-ray findings in non-opaque foreign bodies in the air passages. He found that non-opaque foreign bodies produced either obstructive emphysema or atelectasis on the affected

side. This is particularly well shown on plates made in different phases of respiration. As a result of Manges' work it became immediately apparent that primary bronchial carcinoma gave identical findings and thus early primary new growths of the lung began to be recognized.

Bone Pathology and Injury

Much good work had been done on the x-ray diagnosis of bone diseases prior to 1917, chiefly by German workers, notably Alban Koehler.

It was not until 1921 that an excellent English text appeared on the subject. In that year, Dr. F. H. Baetjer and Dr. C. A. Waters of the Department of Radiology of Johns Hopkins University published their textbook entitled "Diseases and Injuries of the Bones and Joints." This text, written primarily for the medical student, was of far greater aid to most radiologists than its modest authors would admit. It remained the standard work in this country until the English edition of Koehler's work appeared in 1929. Baetjer and Waters were, however, the pathfinders in the diagnosis of bone diseases. The basic principles brought out by them furnished the ground work for all the work which has since been done in bone pathology.

Gastro-Intestinal Tract

The x-ray diagnosis of diseases of the gastro-intestinal tract was resting on a sound foundation prior to 1917. Most of the pathologic conditions encountered therein had been described before that time.

Akerlund, in 1921, published his work on duodenal ulcer. He was the first to call attention to the visualization of an ulcer crater on the posterior wall of the cap, and visible only when localized pressure was applied over the cap during the fluoroscopic and plate examination.

Lawrason Brown and Homer Sampson of Saranac Lake, in 1926, published a monograph on intestinal tuberculosis and accurately described the x-ray findings in both the hypertrophic and ulcerative types of this disease.

X-Ray Treatment

The x-ray was employed in the treatment of diseases of the skin within a year after the Roentgen discovery. Pusey of Chicago and Caldwell of New York published a small treatise on the subject in 1898.

Little progress, however, was made in x-ray treatment until the period immediately following the World War. Coolidge at that time developed an x-ray tube capable of handling 200,000 volts and the manufacturers immediately responded with a machine capable of furnishing the current. Since that time both tubes and machines capable of delivering voltages in excess of two million volts have been developed.

Used alone or in combination with radium in selected cases, treatment at higher voltages has done much to reduce the mortality in certain forms of malignant new growths. It has also been a remarkable palliative agent in skeletal metastases. Many conditions, however, do not need these higher voltages. It should be borne in mind always that superficial growths as well as all growths extremely susceptible to radiation should be treated with the lower voltages rather than the higher. The reason for this is the obvious damage done to the normal surrounding tissues. This is best shown by the tremendous increase in pulmonary atrophy or radiation fibrosis of the lungs which developed following the use of higher voltages in the treatment of carcinoma of the breast.

In deepseated abdominal new growths, however, the higher voltages have a very definite advantage. Judiciously used in combination with radium this treatment has resulted in a remarkably higher incidence of cures in carcinoma of the cervix of the uterus. Postoperative radiation in carcinoma of the breast has considerably increased the incidence of five- and ten-year cures when compared with the non-radiated cases.

The reader should bear in mind that the writer has of necessity not been able because of lack of space to give any detailed account of much of the valuable work which has been done by hundreds of capable men during the past twenty-five years. It has only been possible to mention epoch-making discoveries in apparatus and media, in addition to the few outstanding diagnostic procedures which have had the greatest influence in the widespread use of this still comparatively young specialty.

Malaria is not confined to the tropics; in 1937 there were 4,000,000 cases in the United States.

PRIMARY BRONCHIOGENIC CARCINOMA

Report of a Five-Year Surgical Cure

THOS. J. KINSELLA, M.D.

Clinical Assistant, Professor of Surgery, University of Minnesota Medical School
Minneapolis, Minnesota

PRIMARY bronchiogenic carcinoma, in spite of its relative frequency, is probably less well understood than most conditions encountered by the physician in general practice. Much of this occurs because the average physician is quite unfamiliar with the disease as seen clinically, the rest because of the varied picture which the condition itself may present. It is, without doubt, the most notorious masquerader with which we are commonly called upon to contend.

This condition, in the mind of the average physician, is considered a rare one which need not be constantly kept in mind. Such, however, is not the case. It is found in at least 1 per cent of all postmortem examinations, and thus cannot be considered a rare condition. It constitutes from 12 to 15 per cent of all carcinomas encountered at autopsy, and is of the same approximate order of frequency as carcinoma of the uterus and carcinoma of the rectum. The apparent, marked increase in frequency observed clinically can easily be explained by a better appreciation of the clinical picture, while the increase noted in postmortem series may be offset to a considerable degree by a recognition of the fact that numerous cases previously diagnosed as sarcoma of the mediastinum, endothelioma of the pleura, sarcoma of the lung and carcinoma, primary site undetermined, were in reality cases of primary bronchiogenic carcinoma with metastases.

Primary cancer of the lung begins as a malignant pathological process in the wall of one of the bronchi, hence the accepted name primary bronchiogenic carcinoma. Microscopically it may appear as a fairly well differentiated glandular type of structure, adenocarcinoma, as a fairly well differentiated epithelial structure, squamous cell carcinoma, or more commonly as a more rapidly growing undifferentiated mass, now referred to as undifferentiated carcinoma, formerly called an oat-cell tumor or even a sarcoma of the lung. It may begin towards the periphery of the lung but is more commonly recognized in the larger bronchial radicals. The growth may develop relatively slowly or very rapidly, depending upon the type and degree of differentiation of the tumor itself. This, however, need not be consistent as in some tumors certain areas may be found showing well differentiated adenocarcinoma, others well differentiated squamous cell carcinoma, and still others a wildly growing undifferentiated tumor.

All types of these tumors tend to metastasize, some sooner than others, but all relatively early, and frequently very extensively. Metastases occur frequently along the lymphatics underneath the bronchial mucosa where the tumor may infiltrate to a considerable distance beyond the original site. The regional and mediastinal nodes soon become involved. A few extend peripherally to involve the pleura and chest wall early. The liver is the next most frequent site and is commonly involved, often so extensively that the primary tumor is dwarfed, and an abdominal primary tumor is sought. Widespread metastases throughout the body are frequently seen, with involvement of the brain, the osseous system, the adrenal, kidney, pancreas, thyroid, spleen, cardiac muscle, skin and almost any other structure. Such metastases may so completely overshadow the small primary tumor that it is missed, not only clinically, but even at pathological examination unless a careful search is made.

The frequency of brain metastases in primary bronchiogenic carcinoma is well recognized by the neurological surgeons, who on numerous occasions in the past have explored what were apparently primary cerebral tumors only to find that they were metastatic from a small unrecognized primary in the lung. The metastatic deposits in thyroid, adrenal, kidney and pancreas have at times been mistaken for the primary site of the malignant process and undoubtedly in the past have led to considerable confusion as to the relative frequency of bronchiogenic carcinoma. The pathological course and progress of the condition is so extremely varied that it naturally may be expected to produce a very bizarre clinical picture.

Clinically, as with other carcinoma, this pri-

mary tumor of the lung is essentially a disease of the latter half of life, occurring most frequently in the fifth, sixth and seventh decades, although it has been reported in almost every year of life, from a few months of age to the nineties. It must, however, be given most serious consideration in differential diagnosis in patients beyond the age of forty. It occurs four times as commonly in males as in females, a consideration which may be given some weight in making a differential diagnosis in the female patient.

There is, perhaps, no pathological condition which so frequently and efficiently masquerades as some other process. The clinical picture of pneumonia, pulmonary tuberculosis, virus pneumonia, lung abscess, bronchiectasis, empyema and metastatic tumor in the lung may all be simulated by primary carcinoma, or may even be associated with it. An exceedingly careful clinical study may be required to establish the true diagnosis. Probably the most difficult differential diagnosis is that involving a process in the upper portion of the lung with some atelectasis present where tuberculosis and carcinoma must be distinguished, as this is an area where both conditions are frequently encountered. Atelectasis may occur in both, while cough and expectoration, fever, wheezing, blood streaked sputum, tightness in the chest or pleurisy, loss of weight, anemia, and loss of a sense of well-being may occur with either one. The finding of tubercle bacilli in the sputum, of course, would establish the one diagnosis, yet numerous cases of pulmonary tuberculosis with atelectasis do not show a positive sputum at all times because of the bronchial obstruction present.

The occurrence of cavitation within the involved area which ordinarily would suggest tuberculosis may not absolutely indicate it because bronchiectatic cavitations may occur distal to the obstructing mass of a bronchiogenic carcinoma. Bronchoscopic examination, which in other localities of the lung is of extreme value, here may reveal no information whatsoever, as the upper lobe bronchus except for its orifice cannot be visualized through the bronchoscope, and nothing may be available for biopsy examination. Cutaneous tests, cultures, smears, and blocked sputum specimens, iodized oil bronchograms and all other available means may be exhausted and yet no positive proof of the diagnosis established. The case forming the basis for this report is an excellent example of this problem. In other instances, the finding of a positive sputum does not rule out carcinoma as the two conditions may coexist, and it is only the alert clinician who will be able to make the complete diagnosis.

The x-ray picture of bronchiogenic carcinoma is frequently considered a pneumonia until the process fails to clear. The same difficulty to a greater degree may be encountered in the so-called virus pneumonia where the picture may simulate a bronchiogenic carcinoma and where delayed resolution is common and will excite less concern than in an ordinary pneumonia. It is well recognized clinically that lung abscess and bronchiectasis may develop distal to any bronchial obstruction, and as bronchiogenic carcinoma so commonly gives partial or complete bronchial obstruction, it is not surprising that an associated lung abscess or bronchiestasis is observed quite frequently, particularly in the slower growing tumors. Add to this the fact that certain malignant bronchial tumors undergo central degeneration with abscess formation and we add another element of confusion. It is common knowledge that 10 per cent of the chronic lung abscesses occur distal to an obstructing bronchial tumor. In older people a lung abscess is quite likely to represent a degenerating carcinoma.

Certain bronchial tumors extend peripherally and involve the pleura, inducing pleurisy or a pleural effusion, either clear, bloody or purulent. The differential diagnosis between carcinoma and tuberculosis with a clear or bloody effusion is not always readily made. In the presence of a purulent effusion the finding of any type of organism in the pus does not rule out carcinoma as secondary inflammatory disease may complicate the picture and lead to an empyema. The recognition of tumor cells in direct or blocked sediments of pleural fluid is not always as simple as it might seem, and unless the pathologist has had considerable experience in such examinations it is likely to lead to errors in both directions.

Metastatic tumors to the lung from other sources may simulate bronchiogenic carcinoma, and conversely bronchiogenic carcinoma may simulate or produce metastatic lesions in the lung fields and elsewhere and lead to error in diagnosis. Some tumors, notably hypernephroma and carcinoma of the colon, have been reported as metastasizing to the bronchial mucosa producing an obstructing lesion which could be visualized

through the bronchoscope and at times recognized by biopsy specimens thus obtained. The clinical picture encountered then may be very bizarre, and a great deal of thought and study and numerous examinations required before the true diagnosis is established.

The clinical picture presented by bronchiogenic carcinoma can probably be understood better if consideration is first given to the development and progress of the local lesion. Bronchiogenic carcinoma apparently begins as an isolated neoplastic node in the wall of a bronchus of small, medium, or large calibre. As the mass develops it encroaches upon the lumen of the bronchus, interfering with the passage of air through this area, exciting some secretion and some local irritation, which may produce a slight cough, oftentimes dry, but possibly producing a small amount of clear, mucoid sputum. If ulceration occurs on the surface of the growth, or if coughing is severe, blood streaks or even a small amount of blood may be expectorated. As the growth increases in size filling the bronchial lumen, and it takes only a smaller tumor to do this, even in the larger bronchi, it produces some interference with the passage of air by this point. If this obstruction is partial and permits the entrance of air, but not its exit, there will develop in the lung distal to the tumor an obstructive emphysema which if small will give no clinical findings, but which if large may be detected on physical examination as an area of normal to hyperresonant percussion note, with distant breath sounds and probably no rales, and on x-ray as a local area of increased translucency of the lung.

If the obstruction becomes more complete and air can neither enter nor leave the involved area of the lung, the air trapped distal to the mass absorbs rather rapidly producing an atelectasis of this portion of the lung which again if small cannot be found clinically but which if larger may be recognized by an area of altered percussion note, from impairment to dullness, with distant to absent breath sounds early, later replaced by the increased transmission of solidified lung. There are usually no rales present, though if the obstruction is slightly intermittent or is altered by deep breathing or cough, a wheeze or squeak may at times be heard. Clinically there is a sensation of tightness in the chest in the involved area, at times interpreted as slight pleural pain. Roentgenograms show an area of increased density in the lung field usually of homogeneous consistency with displacement of the heart, mediastinum or diaphragm to the involved side, if the area involved is large.

The patient by this time may have noticed a slight wheeze or clicking sensation in the involved area, particularly after cough, on exertion, or upon taking a deep breath, and may have experienced a gradual loss of strength, a sense of fatigue, or may have become somewhat anemic depending upon the amount of cachexia associated with the local growth. As the tumor continues to grow there is frequently increasing cough with expectoration of nonpurulent sputum, at times blood streaked, occasionally true pleural pain, a slight sense of breathlessness even without exertion, or even an inability to take a deep breath. If secondary infection now enters into the picture in that portion of the lung distal to the obstruction there may be a change in the character of the sputum which may take on the character of that of a bronchitis or bronchiectasis, or even become foul if abscess develops. Fever in varying degree may appear. Ulceration of the local growth may produce frequent bleeding, usually not large in amount, though rarely it may be so. If pleural involvement occurs a pleural effusion may develop following an acute attack of pleurisy and increasing dyspnea result from the accumulation of fluid in the pleural cavity.

The progress from the original state to this stage may be a matter of days, weeks or even months depending upon the rapidity of growth of the tumor and the amount of obstruction produced. By this time usually the patient has sought medical advice and may have received considerable treatment under a variety of diagnoses. Primary bronchiogenic carcinoma may be considered, though it frequently has not been given any consideration up to this time. As the disease progresses all symptoms may become more marked. The patient may now begin to complain of symptoms resulting from secondary involvement of other structures, such as pain from involvement of the pleura, chest wall or ribs, or difficulty in breathing from the involvement of the bronchial nodes; difficulty in swallowing from encroachment of such nodes upon the esophagus, or breathlessness from interruption of the phrenic nerve by tumor tissue in the mediastinum or by increasing pleural effusion; pain in the shoulder girdle or tro-

phy of the muscles about the shoulder girdle from direct involvement of the upper ribs, vertebral bodies or brachial plexus as occurs at times in apical carcinoma; eye symptoms from interruption of the sympathetic trunk; headaches, nausea and vomiting and all of the findings of a primary brain tumor from cerebral metastases; backache and abdominal pain from involvement of the retroperitoneal nodes and the liver, or local symptoms referrable to almost any site invaded by the tumor.

Secondary infection in the lung about the tumor may change the whole picture to one characteristic only of lung abscess or bronchiectasis, or if in the pleural cavity to that of an ordinary empyema. From a diagnostic standpoint these latter considerations are of interest and must be taken into account, but from a therapeutic standpoint they all develop because of the spread of the disease from the original local site and are indications of disease which has progressed beyond the stage where clinical cure can be obtained by any means. Our clinical goal must be the diagnosis of the disease before it has reached this stage if we hope to offer more than palliative treatment to the patient.

Diagnosis

Probably one of the most important factors in establishing a diagnosis of primary bronchiogenic carcinoma lies in keeping the condition always in mind and looking for it under any and all circumstances. It is most frequently overlooked because it is not considered in the differential diagnosis. In general, any patient over forty, particularly a male, who develops unexplained, persistent cough, expectoration, blood spitting, wheezing, breathlessness, tightness in the chest, pleurisy or pleurisy with effusion, asthma, "chronic bronchitis," should be suspected of possible bronchial involvement. Added to this group should be all patients presenting unresolved or slowly resolving pneumonias, atelectasis, localized emphysema, and all other peculiar or unusual shadows on x-ray, particularly in the older group, but including some in all age groups. The findings of a local emphysema or atelectasis, or a localized persistent wheeze on physical examination should arouse suspicion of a bronchial obstruction, possibly from tumor.

Sputum studies to relatively rule out tuberculosis should always be made, following which sputum, particularly particles which might resemble tissue, should be embedded, and sectioned for microscopic examination for tumor cells. Similar studies should be carried out on pleural fluid. Roentgenograms of the chest, and good iodized oil bronchograms should then be made. No examination is complete without a thorough bronchoscopic examination with biopsy of suspicious areas. In upper lobe lesions with atelectasis where nothing can be seen on bronchoscopic examination, it may be wise to establish an artificial pneumothorax on the affected side with the idea of pushing the upper lobe down and changing the angle of the upper lobe bronchus so that it may more readily be visualized. In certain instances, following the establishment of pneumothorax, pleuroscopy may be indicated if pleural metastases are suspected. This procedure may at times save the individual an unnecessary exploratory thoracotomy.

When all other methods of conclusively establishing the diagnosis have failed and there is still a strong probability of bronchiogenic carcinoma or one cannot be certain whether the lesion is operable or not, even when clinically proven, exploratory thoracotomy is indicated. At times this will reveal ample evidence of the presence of a bronchiogenic carcinoma which can then be adequately treated surgically at the time. It was by finally resorting to this method that the present five-year cure was accomplished.

Once the diagnosis has been established and surgery is being considered, thorough studies must be made to rule out metastases in all possible locations. The establishment of a pneumoperitoneum, followed by roentgenograms of the liver region for irregularities may at times reveal liver metastases. Peritoneoscopy with direct visualization of the surface of the liver may demonstrate liver metastases which, of course, would indicate a hopeless, inoperable condition.

Treatment

The fundamental considerations in the treatment of primary bronchiogenic carcinoma are the same as those of carcinoma elsewhere in the body, namely, early diagnosis and the complete eradication of the tumor-bearing organ and its regional lymphatics before the disease has spread from its local site of origin. This, in primary bronchiogenic carcinoma, means a total pneumonectomy by primary dissection within the mediastinum, with removal of the regional lymph nodes which drain the affected lung. Lobectomy

or pneumonectomy by tourniquet method should be regarded as incomplete operations and considered as analagous to simple amputation of the breast for carcinoma. If the condition is inoperable as proven by preliminary studies or at exploratory thoracotomy, which must be resorted to quite frequently, then palliative treatment by radiation therapy may be indicated and may at times afford considerable relief. It is not, however, to be considered as curative as no convincing cured cases have been reported by this method. For the relief of dyspnea, cough, wheezing, chest pain or certain obstructive symptoms considerable may at times be accomplished by it.

Criteria of Operability

Once the diagnosis of primary bronchiogenic carcinoma has been established the whole situation should be reviewed as to the possibilities of surgical intervention. The following may be presented as criteria of possible operability.

1. Absence of metastases both local and distant, especially in the lung, pleura, mediastinum, liver and brain.

2. The absence of nerve or bone involvement, particularly of the phrenic, recurrent laryngeal or sympathetic trunks, and the ribs adjacent to the tumor.

3. The absence of pleural fluid, even if carcinoma cells cannot be demonstrated in it.

4. The absence of involvement in the trachea and proximal centimeter of the main bronchus on the affected side.

5. The absence of rigidity of the trachea or bronchi on the affected side, suggestive of peribronchial infiltration or nodal involvement.

6. The absence of cardiac, renal or other serious constitutional disease.

7. The general physique must be sufficiently robust to offer a legitimate chance of withstanding the radical operation necessary.

8. The age group and expectancy must be such as to justify the radical surgery.

Contrariwise, the following may be considered as absolute criteria of inoperability:

1. Distant metastases of any type.

2. Large mediastinal mass.

3. Evidence of interruption of the phrenic, sympathetic or recurrent laryngeal nerve from direct infiltration by advancing tumor.

4. Cervical or axillary nodes positive to biopsy.

5. Involvement of the trachea or primary bronchus immediately adjacent to it by tumor tissue.

6. Evidence of pleural involvement with demonstrable masses, the finding of malignant cells in pleural fluid, and possibly even the presence of pleural fluid alone.

7. Age, marked debility, coronary heart disease, or other serious lesion indicating a limited expectancy.

If the conditions first outlined can be met, or at least tentatively met, we then feel justified in recommending an exploratory thoracotomy, planning upon radical surgery if local conditions prove favorable. At operation, local conditions may be found which render the condition inoperable, such as lymph node involvement beyond the primary nodes, direct infiltration of the chest wall, invasion or fixation of tissues within the mediastinum. The finding of isolated lymph nodes in the mediastinum *per se* may not indicate that the condition itself is inoperable, because associated secondary infection in the lung may give rise to a nonmalignant lymphadenitis.

From the surgical standpoint primary bronchiogenic carcinoma presents some of the same surgical possibilities for cure as does carcinoma of certain other accessible localities, such as the breast, stomach and colon, where there is a blood supply which can be controlled and a primary lymphatic drainage system which can be excised with the tumor and surrounding tissues. The surgical possibilities of such a condition have been recognized for a considerable period of time, but it is only within the last ten years, with the modern developments in thoracic surgery and anesthesia that the condition has been successfully treated surgically.

Resection of the lung may be carried out either through an anterior or a posterior thoracic incision depending upon the surgeon's preference. Both afford adequate exposure and access to the hilum of the lung for primary ligation of the vessels, primary section and suture of the bronchus and a primary excision of the regional lymphatic nodes. If conditions warrant, the procedure may be carried out in two stages, the first including a dissection of the hilar structures up to and including ligation of the pulmonary artery, for the lung will survive following its ligation if there is no interference with the venous return. The second stage of the extirpation may be carried out at a subsequent date. Pneumo-

nectomy by mass ligation, lobectomy by either mass ligation or primary dissection must be considered as inadequate operations for they do not fulfill the primary principles recognized as adequate for the successful treatment of malignant disease.

Case Report

Mr. A.I.B., sixty-two years of age, a hotel keeper and former railroad conductor, was admitted to the Northwestern Hospital on July 7, 1937. He first consulted me on June 21, 1937, on the advice of Dr. E. E. Carpenter of Superior, Wisconsin, because of cough, fever and loss of weight. He had apparently been perfectly well until the middle of December, 1936, when he developed an acute tonsillitis followed by a severe arthritis of his right great toe which persisted for two weeks. With the tonsillitis he developed a fever of 101 degrees Fahrenheit with cough and expectoration of a clear mucoid material, 15 cubic centimeters in amount in twenty-four hours. After the acute process had subsided, however, cough and expectoration of clear mucus with some dyspnea without wheezing persisted. Physical examination and fluoroscopic examination on January 20, 1937, were reported as negative. He gradually lost in weight and strength. An x-ray picture of his chest in April was interpreted as showing an unresolved pneumonia.

He remained in a rest home for a few weeks until his admission to the Middle River Sanatorium on May 26, with a tentative diagnosis of pulmonary tuberculosis. All studies in the sanatorium, including many examinations of sputum and guinea pig inoculations, were negative for tuberculosis. The possibility of bronchiogenic carcinoma was considered and he was referred to Minneapolis for further studies. During this period of time he had lost weight from 217 to 178 pounds, but had regained 7 pounds during his residence in the sanatorium. His cough and expectoration had continued but the dyspnea had disappeared with bed rest. There had been no wheezing at any time. For a period of about ten days there had been slight discomfort in the left anterior chest which disappeared under symptomatic treatment. Aside from a persistent fever of 99 to 100 he had no symptoms of note.

Physical examination revealed a large, well-developed, well-nourished, adult male, 5 feet 9¾ inches tall, weighing 185 pounds, with evidence of recent weight loss. His blood pressure was 120/70, pulse 82, temperature 98.4, respiration 18. The head, eyes, ears, nose and throat were normal. There were no enlarged lymph nodes. The thyroid gland was normal. The heart was normal. The blood vessels were soft. The right side of the chest was negative to physical examination except for an occasional sibilant rhonchus on deep inspiration in the inner second interspace, probably transmitted. The left side of the chest showed a normal percussion note with breath sounds very distant over the upper lobe. Whispered voice, spoken voice and tactile fremitus were diminished over the upper lobe, with a sibilant rhonchus on deep inspiration in the upper half of the chest. There were no rales to be heard after cough. The left diaphragm was slightly elevated but not paralyzed. The abdomen was normal, the liver not palpable, and no masses present. The genitals were normal. Rectal examination was negative. The reflexes were normal.

Laboratory Findings: Hemoglobin, 11.2 grams; erythrocytes, 3,911,000; leukocytes, 11,300; polymorphonuclears, 74.5 per cent; lymphocytes, 16 per cent; large mononuclears, 3.5 per cent; eosinophiles, 5 per cent.

The blood Wassermann was negative. The urine was normal. The electrocardiogram was normal. The sputum was negative for tubercle bacilli, and no tumor cells could be found.

Radiograph of the chest showed the heart and aorta shadows normal in size, shape and position. The right lung was normal, right diaphragm free. The left side of the chest showed a homogeneous density extending out from the hilar region in the upper portion of the chest which had increased considerably since the previous examination in May of 1937. This represented a localized atelectasis with some secondary emphysema in the upper lobe. The left diaphragm was slightly elevated.

A radiograph of the chest made after the establishment of a diagnostic left pneumothorax showed the right lung to be clear with a density extending out from the left hilum which was definitely in the left upper lobe. Conclusion: Bronchiogenic carcinoma with atelectasis and emphysema of the left upper lobe; normal right lung.

X-ray examination after the ingestion of barium revealed a normal stomach and cap, a normal distribution of the meal at the end of six hours, and a normal colon. There was an extensive hypertrophic arthritis of the lumbar spine.

Bronchoscopic examination performed by Dr. L. R. Boies on July 8, 1937, was reported as follows: The tracheal mucosa appeared to be normal. The carina was not thickened or injected. The openings of the right lower, middle and upper lobe bronchi were normal. In the left main bronchus there was an excessive amount of secretion. The mucosa of the left main bronchus was definitely injected and thickened, but there was no granulation nor points that bled easily. The lumen of the secondary trunks contained purulent secretion which was aspirated. There seemed to be some edema about the orifices of these secondary bronchi, with no evidence of any tissue suggesting malignant disease.

After the establishment of a left artificial pneumothorax another bronchoscopy was performed by Dr. Boies who reported as follows: The right side was negative. The left main bronchus contained a moderate amount of mucopurulent secretion. The bronchus to the left upper lobe appeared to have sagged down moderately as if it were compressed. No tumor or granuloma could be seen. The bronchus to the upper lobe could not be explored.

Although after extensive study we could not visualize a bronchiogenic carcinoma we were convinced clinically and by the x-ray picture that this condition did exist.

After discussing the whole picture with the patient and the family an exploratory thoracotomy was recommended.

Operation: Left total pneumonectomy (Reinhof technique). On July 20, 1937, under intratracheal cyclopropane anesthesia administered by Dr. Ralph T. Knight the left side of the thorax was opened through a curved anterior incision over the third interspace, with section of the cartilage above and below. There was an extensive pneumothorax present. The mediastinum was quite stable. There were extensive adhesions along a linear line at the level of the third rib anteriorly for a distance of about 12 centimeters. The upper lobe was adherent to the mediastinum above the hilum and to the lower lobe along the interlobar fissure. The upper lobe showed an obstructive emphysema, the lobe collapsing very little even under pressure, interfering considerably with our exposure. The lower portion of the upper lobe showed a hard nodule in the periphery with considerable induration throughout the lower half. The lobe, however, was mildly crepitant throughout, with a marked anthracosis present. The lower lobe was apparently normal. The hilar structures were not indurated; there were no large nodes present. There was no free fluid or tumor mass in the pleural cavity.

After the mediastinal pleura was opened, three enlarged lymph nodes were encountered, two above the pulmonary artery and one below the inferior pulmonary vein. These were dark and soft and were excised and sent to the laboratory for examination and reported as negative for tumor.

The pulmonary artery was freed by blunt dissection, doubly ligated with No. 2 chromic catgut, transfixed and again doubly ligated with braided silk and then sectioned. The superior and inferior pulmonary veins were treated in like manner. The main bronchus was then dissected free, cut across about a centimeter from the carina, slit for a short distance transversely to weaken the cartilages and then closed with two layers of interrupted silk sutures. All lymph nodes encountered locally were excised. The posterior flap of mediastinal pleura was then tacked over the bronchial stump and the rest of the mediastinal defect closed with continuous silk suture. The chest wall was then closed without drainage, resuturing the divided cartilages and approximating the ribs by pericostal sutures, closing the intercostal muscles with continuous catgut and tacking the pectoralis muscle down over the incision to give an air-tight closure. The skin was closed by a lock stitch of dermal suture and then sealed with mastisol.

The patient tolerated the operative procedure very well, and while on the table was given 1000 c.c. of citrated blood, 2500 c.c. of normal saline and 500 c.c. of 5 per cent dextrose. The highest blood pressure recorded was 160/84, the lowest 96/64. The highest pulse rate was 96, the lowest 72. The highest respiratory rate 24, lowest 16. At the close of the operation his blood pressure was 124/80, pulse 84, respiration 20. He returned to his bed in good condition and was immediately placed in an oxygen tent where he remained for thirty-six hours when he decided he wished it discontinued. His condition remained satisfactory. He had considerable thick mucus in his throat which gave him a moderate amount of cough from which he developed considerable subcutaneous emphysema over the left side of his chest. Blood pressure, pulse and temperature were good, and the respiration slow except when disturbed by cough. There was no cyanosis present. The right lung remained normal except for a few coarse rhonchi at the base, a rather inconstant finding.

The wound healed by primary intention and remained clean. The left pleural cavity rapidly filled with fluid, a small amount of which was aspirated for study on the eleventh postoperative day. It was a clear amber fluid which was sterile on culture. His condition continued to be satisfactory with gradual disappearance of his cough and expectoration. He was discharged from the hospital on August 25, 1937, on the thirty-sixth postoperative day, weighing 161 pounds, after walking freely about the hospital for several days.

The excised lung showed a tumor not over 1.5 cm. in diameter obstructing the left upper lobe bronchus. It was somewhat irregular in shape, lying wholly within the lumen of the upper lobe bronchus, approximately 1 cm. up from its opening. There were two indurated areas in the parenchyma of the upper lobe which on section showed a marked bronchiectasis with considerable secretion present. There was an obstructive emphysema of the whole upper lobe. Microscopic examination of the tumor itself showed a well differentiated squamous cell carcinoma. The indurated areas of the lung showed only an organizing pneumonia with no malignant tissue present. The excised lymph nodes showed no evidence of tumor.

The patient's subsequent course has been entirely satisfactory. The left pleural cavity apparently filled with fluid which later coagulated, giving a diffuse opaque shadow over this side. There has been a gradual shift of the heart and mediastinum to the left without excessive displacement or embarrassment. The patient has remained in good health and has had no serious illness since that time. He has only very slight dyspnea which apparently does not handicap him as he has been able to continue his work as manager of a small hotel. It has been unnecessary to even consider collapsing his left chest wall by thoracoplasty as is sometimes necessary if mediastinal displacement causes trouble. He remains in good condition at the present time, five years and three months after the total removal of his left lung for carcinoma. Incidentally, this case is of interest historically as it is the first successful total pneumonectomy for carcinoma in Minnesota or adjacent territory.

For the first time since 1935 and the second time in history, the Hawaiian Board of Health recorded no deaths from diphtheria last year, in spite of the war.

MEDICINE IN MINNESOTA SIXTY YEARS AGO

WILLIAM DAVIS, M.D.
Saint Paul, Minnesota

ACCORDING to the United States census of 1880 the population of Minnesota in that year was 780,000, just two million less than in the last census. Minneapolis, the largest city, had 46,000 and Saint Paul 41,000. Duluth, now the third city in the state, was then a village of 3,500. While physically it was the beautiful state of today, perhaps even more beautiful, because its woods and waters were less disturbed by man, it was a far less comfortable place in which to practice medicine, its country roads for the most part merely beaten tracks across the prairie, with little attention paid to grading, surfacing, and drainage.

Even in the cities there was no block paving and little macadam in the streets, with sidewalks, if built at all, made only of wood. The result was deep dust in summer, mud in spring and fall. Only in winter was the going really good when the streets, little vexed by car tracks, had a uniform coating of ice and packed snow that made wonderful sleighing, so lasting and reliable that the fire apparatus abandoned wheels and went on runners for weeks and sometimes for months.

Railroads were few and accommodations simple. Two lines brought the passengers from Chicago and the trains took fourteen hours for the trip, stopping at eating houses for meals. The Northern Pacific was nearly through to the Pacific coast, the Great Northern, then the Manitoba Road, following soon. There were two roads north to Lake Superior. Trains had just emerged from the old jerky link and pin to the solid coupling. In the cities there were a few street car lines, the cars drawn by one or two horses or mules, the car seats running lengthwise, and in cold weather a few inches of straw on the floor. The driver on an open platform not infrequently got his nose frozen and shivered in a buffalo coat.

Such were the external conditions under which medicine was practiced. The doctor came from a college with at most a three-year course, or he bought his authority to practice from a diploma mill. But the Medical Practice Act was on its way and irregulars were about to be curbed. Even as it was then, it is surprising how little in evidence were the incompetents. The man with three years in a medical school and a year in a hospital represented the best equipment for medical practice.

Few of the counties in the state had their own medical society or one within reach in a neighboring county. The meeting of the State Society gave to many doctors their only opportunity of getting into contact with their fellow practitioners and exchanging professional information and experiences. It was discouraging work to try to keep a county society going, where the members were few in number and widely scattered. Sometimes not even a quorum of one could be raised for a stated meeting. Even in the cities things were not any too good. At least in Ramsey County the meetings were held in some doctor's office, with scanty attendance and little enthusiasm. The office was in a downtown building, heated by a stove and lighted by kerosene lamps or flaring gas jets. Few buildings had radiators and only a few of the most opulent specialists could afford an office with steam heat. Not always could even a single medical paper be furnished. No wonder attendance languished at times, and that at one meeting of the Ramsey County Society the secretary records the presence of three doctors and his, the secretary's dog. In the country, of course, it was impossible to make professional calls without some kind of a team. As the roads were broken out chiefly by farm wagons it was awkward for one horse to travel, particularly in winter, where a single horse could get along only if the shafts were attached to the side of the cutter so that the horse would track with one of a team. In the city most of the doctors' buggies and cutters were drawn by one horse, only a few men being able to drive a pair. In the early years of his practice the city doctor sometimes managed to get about on foot, using the street cars as far as he could; indeed, even so prominent a surgeon as Fenger, of Chicago, through his whole career had no horse. But few doctors failed to set up a rig as soon as they could afford one. While

making a visit the horse would be anchored by a weight, and in cold weather had to be blanketed, a process that must have been attended with some risk of carrying tetanus germs to the patient.

Telephones were not in general use, and although practically every doctor had a telephone in his house, many offices were not so provided. It was largely the custom then for the druggist to own office rooms over his store and to lease them cheaply, sometimes to give them rent free to doctors, the druggist expecting the doctor overhead to steer the prescriptions he wrote to the store below. That this led to abuses at the expense of the patient is easily seen. As a part of this alliance the doctor had his office calls come to the drug store, thus saving the expense of an office telephone. A stranger asking at the drug store to be directed to a good doctor would be very sure to be sent to one who fed his prescriptions to that store. To call a doctor, the druggist's telephone frequently was used by people living in the neighborhood, and the fire department, while not permitting the general use of the telephones in the stations, made an exception in the case of a call for a doctor. A large share of the doctor's calls came directly to the house, where a speaking tube led from the porch to the doctor's bedroom in which there was also an extension from the door bell. Once in the early hours of a still summer morning I was awakened by the sound of a gunshot. I listened for a few moments but heard nothing more and was dropping off to sleep again when my door bell rang and through the speaking tube I was asked to go to the house of a patient a few blocks away. Standing on the sidewalk I found a young policeman who said he had brought the call. On reaching the patient I found he had been seized with a pain so unbearable that he felt he must get relief at once. Alone in the house, with no telephone, necessity drove him to fire a shot from his pistol out of the window to attract attention. This brought the policeman of the beat on the run, and when hailed he consented readily to go and call the doctor. Indeed my patient said that the officer's relief was apparent when he found that the shot was an innocent one. Note that this was described as a *young* policeman. Had it been an older and more sophisticated man he might well have moved away from the sound of the shot instead of toward it, particularly as only a few years before a policeman had been shot and killed when on this beat at night.

The only regular medical journal in the state was the *Northwestern Lancet,* which appeared first in 1881 with only a few small pages of reading matter and advertisements, and no cover. Ten years before there had been a *Northwestern Medical and Surgical Journal* which after a fitful and varied existence gave up the ghost. The *Lancet* lives still in the form of the *Journal-Lancet* which is its direct descendant. For some years after the *Lancet* was started the only other medical publication was the bound volume of transactions of the State Medical Society, and that volume was given up when the *Northwestern Lancet* became big enough to publish the transactions and save the Society the expense of the separate volume.

Sixty years ago the prevalent diseases were quite different from those of today. The mortality reports tell us that the disease causing the largest number of deaths was called cholera infantum, a name that no longer appears in the International List of Causes of Death. Diarrhea and enteritis, grouped together today, now cover the class of cases then listed as cholera infantum, which with its congeners enteritis, gastro-duodenitis, entero-colitis, colitis, and infantile convulsions accounted for twice as many deaths as pneumonia, the next in the list; then came typhoid fever, followed by pulmonary tuberculosis, then called phthisis. Diphtheria, with its related membranous croup, so-called, took a heavy toll. On the other hand heart disease and cancer, now the leaders, then were low in the list. The prevalence of typhoid is accounted for by the fact that much of the drinking water came from surface wells. Minneapolis took its public water supply from the river; Saint Paul's city water came from a lake by gravity only, so that only the lower levels of the city could be reached. Pasteurization of milk was yet to come. Tuberculosis was not recognized as directly communicable. Except for smallpox there was no vaccine, and serums for prevention and cure came much later. For the tuberculous, rest came only when forced by increasing weakness; instead of seeking outdoor life the poor consumptive was likely to be shut up in a closed room under heaped up blankets and comforters lest a draft might aggravate his "cold." Influenza appeared as an epidemic first in 1889, although before that

severe colds were sometimes spoken of as influenza. Infantile paralysis was known as a sporadic disease, but it was nearly 1900 before acute poliomyelitis anterior was recognized as an epidemic. Fitz unmasked the appendix in 1886. For the cases that appeared before that time the favorite name was "inflammation of the bowels," the more scientific names, typhlitis, and perityphlitis not being by any means universally used even by doctors. Operation was done only when a manifest abscess called for incision.

The search for the causes of disease was like groping in the dark and the conclusions arrived at seem fantastic today. A case of typhoid threw suspicion upon a neighboring dungheap. Scarlet fever or diphtheria caused a sniffing for sewer gas. Malaria was attributed to the "miasm" arising from low lands. Colds were caught from drafts, not from a sneezing or coughing neighbor. Although Holmes, and later Semmelweiss, had insisted on the contagiousness of puerperal fever, their teachings were not generally acted upon and little attention was paid to keeping clean the hands of doctor and nurse. Fortunately most confinements were in the home, for the mortality in lying-in wards and hospitals was frightful, even as high as 10 per cent, doctors, nurses and contaminated dressings spreading the infection from case to case. Why, the doctor sixty years ago knew almost nothing about the blood except that there were red cells and white cells that could be counted by the hemometer, which, with the microscope, the stethoscope, and the clinical thermometer were the chief tools in general use. The higher powers of the microscope had been but lately developed and, with increasing skill in the staining of specimens, making visible the minute and transparent bodies called microbes, were revolutionizing the old ideas of pathology, putting an end to the long war between the supporters of the humoral and the cellular theories, and causing both factions to unite against the new science of bacteriology. When it came to treatment, the doctor depended chiefly upon long known drugs, with little reliance upon diet and hygiene. He got little help from the few and ill-equipped hospitals, to which the trained nurse was yet to come.

Only a few bold spirits were opening the abdomen. The skull was operated upon only for depressed fracture, and the joints were left severely alone, for the era of antiseptic and later aseptic surgery was only beginning. Abdominal operations were for the most part ovariotomies, huge tumors that had been repeatedly tapped and whose contents nearly filled the wash tub placed under the table. Hernias got trusses. Pelvic surgery was undeveloped and there was little encouragement for cesarean section, which was not successfully performed, in Saint Paul at least, until 1889. Surgery was limited chiefly to amputations, resections, the removal of growths on the surface, and the handling of fractures and dislocations.

There is a temptation to say something about the many fine men who practiced medicine and surgery in Minnesota in those days. To tell about them all would carry this paper beyond its proper limits and to select a few only would be an invidious distinction. Their memory is enshrined in the homes to which they brought help and comfort, and it could have no fitter memorial.

REMINISCENCES

E. SYDNEY BOLEYN, M.D.
Stillwater, Minnesota

MY FIRST patient was a primitive native American, and it happened in this way. Four of us were, by permission, camping on an Indian Reservation, quite a distance from the agency, which was the nearest place where we could obtain needed provisions for ourselves, two ponies, and one dog. This was in the month of June, 1885, and, as our plans were to stay for a year, we had to make several trips to the agency to bring enough supplies to last us for such a period and do it before winter. As it took three days out, one of rest, and three back, the summer was about gone when we felt our rations were ample. When on one of these trips I called on the Agency Doctor for some remedies and when he found out I was medicine-minded he then asked me to stay in his office while he made a call some distance away. I told him I wouldn't know

what to do in case any sick ones called. He said, "Oh, just look around for something—anything you find that won't do them any harm—give it, and with a lot of instructions, for if it does not work you can always blame it on their own carelessness." So I became the Agency Doctor, *pro tem.* An invitation to supper at the doctor's house was looked forward to, as the doctor's wife (bless her) was not only a very charming woman, but also a most excellent cook, and I was comfortably ensconsed in the doctor's swivel chair, feet on the desk, and my thoughts pleasant in anticipation of that supper, when a whoop rudely disturbed my dreams. I looked around and saw a squaw who, while not remarkable in height, was certainly very extraordinary in circumference. I looked at the door, then at her, and wondered how she got in—but there she was. She whooped again, pointed to her stomach, then to her mouth, by which gestures I supposed she wanted medical attention.

Following the doctor's instructions, I took stock of the pills and potions in his surgery and decided on some powders in a tin box, one kind in a blue paper, the other in white. Among the few office fixtures was a wooden bucket, half filled with water, on which sailed a rudderless tin cup; this helped me to solve the problem of medication. I gave her the powder in the blue paper with some water to wash it down; I then put the white powder in the cup, added some water, stirred up the mixture and by motions indicated she should swallow this without delay—which she did. She had hardly downed this when she commenced to roll her eyes and whoop to beat the band. I had to turn about to hide my desire to laugh—she looked so funny. When I looked around she was gone. Then my conscience—it is very inconvenient to have one—commenced to work and smote me viciously, and I knew remorse, until another whoop demanded my attention. There was the same squaw with five more, all pointing toward their tummies and open mouths. I accommodated them as long as the powders lasted; "a good time was had by all." I wondered how they would feel the next day or that night, and also if I had not started something for the doctor. When they were gone I locked up the office—I thought this best—and silently stole away to the doctor's house and told his wife what I had done. It is fortunate that it is next to impossible to perish from laughter, but I think the doctor's good wife then came very near it; not so the doctor, who, when told, said: "Hell, those Seidlitz powders were for the white folks around here and not for the Indians."

My next adventure connected—if remotely—with medicine happened while I was House Physician at St. Barnabas Hospital and a student at the Medical Department of the University of Minnesota in the year 1890. At that time many interns, or house physicians or surgeons, as they were then called, were undergraduates and called doctors, as were medical students just as soon as they entered a medical school, for no good reason that I know of. Dr. Perry H. Millard had now succeeded in establishing a real medical school, up to the standards of the best ones in the states, and, when this became known, the number of students increased so rapidly that a shortage in necessary materials for teaching, especially in anatomy, became acute. I heard Dr. Hendriks complain about the shortage of dissecting material, so, when on one Saturday at a football game I mentioned this to Harry Lee d'Arms of Stillwater, an Ann Arbor student intern at the Minneapolis City Hospital, he told me that a man, a county charge, had died at the Stillwater City Hospital and had not been claimed by any of his relations. Although this man had some money he was, by the influence of a relative in the "Marble Business," put on the county. This relation—so the story ran—would then get his money for putting up a stone, or marker, at his grave. Harry and I decided to act at once but since it was on a Saturday when Dr. Hendriks could not be reached for a requisition (he was the only one in the state then who could issue one), we decided to take a chance without it. We went to Stillwater, claimed the body, and early Monday morning I, with the body, left by train for Minneapolis. Arriving at White Bear I got a telegram ordering me to "bring P. back." I got P. transferred to the Minneapolis branch. At the Minneapolis Union Depot another "bring P. back" awaited me. I hurried out and got a dray man, had him drive as fast as he could to the University Medical School. There the dray man gave the box a pull so that it barely balanced on the rear end of the wagon when he suddenly stopped and excitedly asked, "Is that a stiff?" to which I answered, "Yes." At that he jumped up on his dray, grabbed the lines and cut the horse a smart clip with his whip. The horse jumped,

the box slid off and landed on the sidewalk, and the man went his way without his pay. I got the janitor, Mr. Rose, had him take care of the box and what was in it, and went for Dr. Hendriks for the now badly needed requisition. Dr. Hendriks was lecturing when I rapped on the door, which he opened, and when he saw me he said—without giving me a chance to explain or give a reason for my temerity—"any man old enough to have hair on his face ought to know better than to disturb me while lecturing," slammed the door shut in my face, and that was that. I hurried up to see Dr. P. H. Millard, the Dean, and was lucky in meeting him as he was leaving his office for Saint Paul. Just then another "bring P. back" message was handed me by Rose. With that, my explanation and Rose certifying to the stiff, Dr. Millard (he had lots of hair on his face, too) disturbed Dr. Hendriks, got the requisition and also a handsome apology. Armed with the requisition I went to the depot, met the undertaker and a detective, who pompously put his hand on my shoulder and said, "I arrest you in the name of the law of the Commonwealth of Minnesota." When I asked the reason, he said, "for taking a stiff without a requisition." Then came my hour of triumph when I pulled out the precious document and explained that in the hurry out of Stillwater I forgot to hand it to Mr. C., the undertaker, and this was the last of it as far as I was concerned. However, the next morning the *Minneapolis Journal* had a large picture of Dr. Hendriks right in the center of the front page and in large letters the label, "Body Snatcher." Mr. P., having died from typhoid, then a very fashionable disease, was very lean and made fine dissecting material, and Dr. Hendriks had many demonstrations out of him.

This was the year 1890, also the year when Dr. Koch announced his discovery of tuberculin, which, with its promises, electrified the world. The Medical School and Dispensary was then located across the street from St. Barnabas Hospital. A year later, from near and far, came those afflicted with tuberculosis to get the promised cure by this new treatment, but the University was not prepared to give it. On the spur of the moment I wrote to Dr. Koch, asking for tuberculin, stating I knew the technique, and signed this as House Physician, St. Barnabas Hospital, which in Europe meant a lot but here nothing at all. I posted this letter and promptly forgot all about it until, one day, I received a notice from the Custom House to come and get a package and to pay charges on same.

It proved to be a supply of tuberculin direct from Berlin. Now that I had it, I did not know what to do with it. Among the doctors who had patients at St. Barnabas was Dr. J. Clark Stuart, Professor of Pathology at the University, who, I noticed in going the rounds with him, took a very keen interest in his patients. I went to him and he said, "This is a package from Heaven. We will see Dr. Nothnagle." The latter was an enthusiastic and thorough worker in general medicine at the dispensary. He rounded up quite a number of cases of pulmonary tuberculosis, selected those he thought resistant to other forms of treatment, graded them so that of two of each kind one would receive tuberculin and the other just scientific neglect and serve as a control. Some were hospitalized, but most of them, not very far advanced, stayed at private homes or boarding houses. All of them received special instructions as to rest, exercise, diet and personal hygiene. In six months none of those receiving tuberculin was alive. At first they gained in weight but soon became increasingly anemic and flitted to happier hunting grounds. All of the controls were alive after six months. Most of them improved in health and some were apparently cured or the disease arrested. This was undoubtedly due to a more understanding, sympathetic, personal attention, and to rest and diet.

I think our experience with tuberculin was quite general and fulfillment of the high hopes of cure or prevention of this dreadful disease vanished after many disappointing trials. Since then its real value as a diagnostic agent has been demonstrated and it has proven a boon and an invaluable gift to humanity.

In 1894, the medical care of the inmates of the State Prison at Stillwater was administered by a visiting local doctor who came once daily. A guard, who had been a hospital steward during the Civil War, looked after them in the meantime and also did the nursing, if any.

The twine and shoe factory machinery, worked by the prisoners, caused some accidents and, as the visiting doctor was not always available for such emergencies, the prison management decided to employ a full-time graduate as intern and to bring the so-called hospital up to more modern standards. Dr. Perry H. Millard recommended

me for this position because of my hospital experience and so, after graduating in June of that year, I became the first full-time medical man at this institution. I had to examine all the prisoners there, those who came and those who left. A small laboratory was added to the hospital and surgical instruments were purchased.

At that time the inmates numbered between 550 and 700. Twice a day the Deputy Warden made the rounds and picked up those who wanted to see the doctor, and usually from seventy-five to 100 or more felt this need. That was too many for proper attention and the problem was how to eliminate the "non-sick" or loafers. Cole Younger, who was my runner, made a suggestion that worked; he said that there were a couple of barrels of cod liver oil in the storeroom that had been there for a long time; "how would it be to give the *just loafers* some for a treat?" So, the "float" was born. A float was, at that time, the name of a popular drink; the composition was charged water in a tall glass upon which brandy was poured gently so that the brandy would stay on top and the drinker would enjoy the mingling of the two fluids. However, the float given the "loafers" was not that kind but consisted of rich brown, cod liver oil upon which floated red pepper and quinine. This reduced the sick call to those who really were ailing, and seldom more than thirty came any day.

In Stillwater, as elsewhere, typhoid was very prevalent, and early recognition was desirable when possible. Helpful in this was the diazo-reaction just coming into use. The visiting doctor brought some specimens of urine for examination and in several, this reaction indicated typhoid, and when this proved correct, some of the other doctors sent some specimens, too. I became interested in these cases and inquired about the water and milk supply, traced these and found out that many of the cases appeared along the route of certain milk wagons and that the cows donating the milk for these wagons were watered at Lake McKusick—and thereby hangs a tale. One day, while down town, one of the "City Fathers" stopped me and, in no uncertain terms, told me to lay off on that typhoid stuff.

A few of the inmates were surgical subjects and the hospital was now fairly well equipped for a few of these cases. One was a tuberculous ankle, so badly diseased that amputation was necessary and was done. During the legislative session in 1895 a legislator made the charge that arms and legs were cut off prisoners for rheumatism. An investigation was ordered and held at the State House. The hearing was conducted by Judge Flandrau; when the diseased ankle and foot were shown and the evidence gone over, the Judge promptly discharged the case, after making a few very caustic remarks (and he could be caustic) about the complaining legislator. However, this individual got his last say-so and revenge by having some regulations established whereby any prisoner requiring a surgical operation must have a guardian appointed who must give his full consent before an operation could be done. How long this ruling was in effect, or whether it still is, I do not know.

After leaving the prison, I joined the regular profession as a practitioner in Stillwater. This was in the so-called "Horse and Buggy Days," an expression intended to emphasize the hardships doctors who indulged in country practice had to put up with, although I did not find it so very hard when one could get around with a horse and buggy; but with a horse and sleigh in January, February, March, and into April, the going was really tough and sometimes dangerous. Many of the old fellows, still in practice, could, if they would, tell of experiences that required courage and devotion to duty.

At that time about twenty-one men practiced "the healing art" in Washington County. Most of them were regulars, with three homeopaths and one eclectic. Some of them were not graduates in medicine but had exemption certificates. Several midwives were also on hand, and they were quite busy, too, giving "first aid." Doctors' offices were not then, as now, well equipped. A few chairs, a desk and swivel chair, an examining table, and sometimes a bookcase, made up the furniture. Other professional requirements consisted mostly of a few surgical instruments, in which was included an amputation set, bandages, dressings, fracture splints or material for making them, some tablets, carbolic acid, and sometimes H_2O_2, also an alcohol lamp, nitric acid, Haines solution, and two or three test tubes. For calls he had a medicine case, usually well supplied, a pocket instrument case containing a few needles, sutures, a pair of scissors, a "Bistoury" and in his upper vest pocket a thermometer. His obstetrical case was usually the best looked after and most frequently used. His

medical library was conspicuous rather for its near-absence: a Gray's Anatomy, a volume or two on surgery, practice of medicine, diseases of children, gynecology, obstetrics, and rarely a medical dictionary. The treatment of wounds consisted of washing with soap and water or irrigating with a carbolic acid solution, not always well shaken up (in pus cases, peroxide), and was usually topped off with a generous sprinkling of iodoform. The surgeon's hands or instruments were given no special attention. The antiseptic principles or rules (this was the antiseptic age) were not well understood. As an example: an old doctor practicing in the southern part of the county, took a patient to a Saint Paul surgeon for an abdominal operation. At the operation some interesting conditions were disclosed which the operator wanted the old doctor to palpate, so he said, "Scrub up and sterilize your hands and feel of this," to which the old man answered, "Oh, I did that before I left, early this morning."

Vaccination and quarantine for some of the communicable diseases were the only preventive measures known or practiced. Typhoid, tuberculosis, diphtheria, pneumonias, influenza, scarlet fever, and measles were the most common ailments and were treated symptomatically with nursing of the most primitive kind. The death rate was quite high, especially in diphtheria. This terrible scourge was given, beside internal medication and diet, heroic local attention by painting affected parts, if reachable, with strong solutions, gargles, sprayings, inhalations and forceful detachment and removal of the false membranes as they formed, and intubation, all too often of no use. The helplessness in these cases was only relieved when antitoxin came into use and its prompt and miraculous effect demonstrated.

I think this was largely responsible for a less suspicious attitude toward newer therapeutics and the many new scientific discoveries now becoming available for practical use. These bewildered the old fellows, as they found it hard to understand them and, besides, were chary in displacing the Old for the New, or, rather, unable to adjust themselves to the New. The younger men, more alert, better educated, easily and eagerly fell in line with anything that proved beneficial and practical.

It is well to remember that, up to quite recent times, the practice of medicine was comparatively unscientific. There were not, as now, well equipped hospitals or richly endowed institutions for highly technical research at the beck and call when help in difficult or obscure cases was needed, nor, perhaps, the willingness of the people to submit to such had there been, as a suspicion toward anything out of the ordinary—unless it were a gold brick—was then harder to overcome.

If now, in 1942, when Minnesota Medicine celebrates its twenty-fifth anniversary and reviews the wonderful advancements in medicine toward a science, we feel inclined to be amused at what has gone before or those who practiced it, keep this in mind, that the therapeutics of today may be out of date and amusing tomorrow. Therefore, let us think of these old fellows, now no more, as honest, kindly, efficient for their time, and doing pretty good work with what they had; let us bare our heads and reverently intone *"Requiescat in pace."*

ARMY DOCTORS IMPORTANT

Military doctors play a decisive role in war between nations and in mankind's peacetime fight against disease. Their triumphs in both kinds of war were reported by Col. Edgar Erskine Hume, of the Army's Medical Field Service School at Carlisle Barracks, in a public lecture at the New York Academy of Medicine.

"Half a million men can turn the tide of a war, even in these days of huge armies," Col. Erskine declared.

The United States, he pointed out, might have had that number of men put out of action in World War I, not by enemy guns but by a single disease if our Army had not been effectively protected against typhoid fever. In the first World War there were only 1,500 cases of typhoid fever instead of half a million as would have been expected on the basis of the numbers affected by this disease in our war with Spain in 1898, before doctors knew how to vaccinate against typhoid fever.

"In all past wars disease has struck down more soldiers than all the combined effects of the enemy's weapons," Col. Hume declared. "The soldier's duty is to fight, not to die, for his country. The Army's medical department has the task of keeping him fit, 'To Conserve Fighting Strength,' to quote the motto of the Medical Field Service School, Carlisle Barracks, Pa."

Recalling that the disastrous ending of Napoleon's Russian campaign was the result of an outbreak of typhus fever, to which the Russians were immune but the French and their allies were not, "Who knows but what something of this kind may not happen in the present war in Russia?" Col. Hume asked.

"Horrible though war is, it has stimulated medical advances," he continued. "Some of the world's great medical discoveries have been made by military surgeons, particularly in connection with field service. Every war has added to the sum of medical knowledge."

—*Science News Letter,* December 19, 1942.

GROUP HOSPITALIZATION

ARTHUR M. CALVIN, Executive Director
Minnesota Hospital Service Association
Saint Paul, Minnesota

"Group Hospitalization," practically an unknown term nine years ago when the Minnesota Hospital Service Association was organized, is now a nationally understood phrase, as familiar to the every-day citizen as it is to the medical profession and to hospital personnel.

In less than a decade, group budgeting of hospital care has become nationally significant. Today, 11,000,000 persons throughout the United States are budgeting their hospital bills through seventy-six non-profit Blue Cross Plans for hospital care. These plans operate on a voluntary basis and are approved by the American Hospital Association.

Employed persons of limited means, reluctant to receive free or part-pay hospitalization, who formerly made valiant efforts to pay their hospital bills from limited resources, have welcomed enthusiastically the development of these non-profit plans which enable them to budget their hospital service conveniently in regular payments.

The Minnesota Hospital Service Association is a pioneer in the group hospitalization field, being the second oldest and the fourth largest of the Blue Cross Plans.

In 1933, when seven Saint Paul hospitals organized this plan, the medical profession of Minnesota, with characteristic foresight, took an active interest in its development. Various aspects of the plan were freely discussed by the hospitals and the medical profession and these discussions were printed in the early issues of Minnesota Medicine.

Because of the attitude of kindly interest of such men as Dr. Carl B. Drake, editor of Minnesota Medicine, who, with many others in the medical profession, believed that a group hospitalization plan could be carried out without interfering with the relationships of patient and doctor, the Minnesota Hospital Service Association has been able to develop rapidly.

Operating on a voluntary basis, the plan has proved to be of tremendous value; first, to the patient; second, to the hospitals; third, to the medical profession, and fourth, to the community.

Today, after nine years of public service the Association's Blue Cross Plan is no longer an experiment. It has definitely proved that non-profit group hospitalization plans can be financially sound and that actuarial experience on the number of subscribers who may be hospitalized and the amount of care they may use, can be computed.

The Minnesota Hospital Service Association, which started with seven hospitals, now has 109 affiliated hospitals throughout the state, which are most cordial in their relationships. The hospitals do not receive profit from the plan, but are assured of prompt payment for hospital service rendered to Blue Cross Plan patients, just as the subscriber is assured of prompt and adequate hospital care when he is ill.

At the present time, 507,000 persons in Minnesota (one person in every five) subscribe to the Blue Cross Plan. The enrollment is distributed as follows: 366,000 in the Twin Cities; 50,000 in Duluth; 91,000 in the rest of the state. Through the coöperation of the Minnesota Farm Bureau, 25,000 farmers and their dependents have been enrolled. It is estimated that by the end of January, 1943, 515,000 persons in the state will be budgeting their hospital care through the Blue Cross Plan of Minnesota.

The outstanding enrollment record of the Plan is surpassed only by its record of service to subscribers. One thousand subscribers are in affiliated hospitals daily. Since 1933, 220,000 subscribers have received hospital care amounting to $6,653,000.00. In the last nine years 26,000 babies have been born to Plan subscribers who have benefited under the maternity clause in the Association's contract.

During 1942, alone, the Plan will pay nearly $1,750,000.00 to its affiliated hospitals for the care of its subscribers.

Through the Blue Cross Plan, hospitals can render greater service than ever to their communities, for when the financial hazard is removed, more people can avail themselves of hospital care when they need it.

Today, with our nation at war, it is imperative that people be able to avail themselves

promptly of hospital care, and so take care of their health, for millions of work days each year are lost through illness. The Government has recently commended the Blue Cross Plan, for it recognizes the contribution the Plan is making to the war effort by helping reduce the number of work days lost through illness. According to national statistics, Blue Cross Plan patients stay in the hospital two days less than other patients. This is because, with the financial hazard removed they seek hospital care earlier and consequently return to normal life and to work more rapidly. It is estimated that in 1942 alone, over 2,000,000 work days will be saved the nation in this manner.

Minnesota's Plan today enjoys financial soundness, but prolonged or unnecessary care to subscribers can quickly and greatly jeopardize this soundness. It is in this respect that such a plan is dependent upon the medical profession who can control, to some extent, a subscriber's need for hospital care as well as the length of time over which he will need such care.

The Minnesota Hospital Service Association's accomplishments in the group hospitalization field were recently acclaimed by officials in medical, hospital, and government circles. At a dinner in October, 1942, celebrating the enrollment of the one-half millionth subscriber to the Association's Blue Cross Plan, Governor Harold E. Stassen remarked:

"This program of the Minnesota Hospital Service Association is a splendid example of a democratic method to solve a problem of community interest. The state has an obligation to coöperate with an organization of this type and has so demonstrated in the past. The totalitarian way of life is for the state to do everything and the people to follow its dictates. Our democratic way of life is for the people to solve their problems in a voluntary way with the utmost cooperation of the government and not for the government to do it all.

"If the government was to carry out a plan of this type it would cost considerably more to administer the plan and it would take a greater number of employes. I wish to congratulate this organization on the service it is rendering to the people of Minnesota."

On this same occasion, the Plan received congratulations from such national figures as Thomas Parran, Surgeon General of the United States; Cordell Hull, Secretary of State, and James Forrestal, Acting Secretary of the Navy. Surgeon General Parran's letter read:

"The Minnesota Hospital Service Association has made a splendid contribution to the conservation of the nation's health in wartime through enlisting a half million members under the Blue Cross Plan.

"Prompt hospital care in sickness and injury will do much to reduce the time lost because of disability in our war industries.

"Please accept my congratulations on your achievement."

A telegram from Cordell Hull stated:

"I am glad to extend my felicitations on this fine record of public service and to send best wishes for the continued success of your Association in the future."

James Forrestal, Acting Secretary of the Navy, commented:

"It is a cause of genuine gratification to our United War effort and to me personally to learn that Minnesota has successfully completed the enrollment of half a million of the good citizens of your state in your Blue Cross Plan.

"The maintenance of sound bodily health is a tap root of national ability to survive in this vast planetary try-out of the quality of whole peoples. But, more than that, your Association brings an opportunity to many thousands of citizens to work together in an unselfish cause, whatever be their other tasks or affiliations, and this in itself is a vital factor no less important than the more obvious physical objectives you have in view.

"Please accept for the Minnesota Hospital Association my very true congratulations and my best wishes for the continuance of a good start towards a communal unity demonstrated by daily work."

The great strides that the Minnesota Hospital Service Association has been able to make in the group hospitalization field could never have been made if the Plan had not received splendid coöperation from physicians, hospitals, nurses, group leaders, employers, labor and civic leaders, clergymen, public officials, the radio and the press.

With the continued coöperation of these forces, the Blue Cross Plan will not only continue to develop and to render valuable service to the people of Minnesota, but it will also continue to be a leader in the group hospitalization field.

CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL

A. J. Hertzog, M.D., and S. V. Lofsness, M.D.
Pathologists

Presentation of a Case

Dr. Mitchell: This case is that of a forty-two-year-old colored woman who was admitted to the Minneapolis General Hospital on October 23, 1942, in an unconscious state. The history was obtained from her husband. She had been employed in a laundry as a steam presser, and her past health had been good. On October 21, two days prior to her admission, she was suddenly seized with severe epigastric pain that was followed by nausea, diarrhea and a feeling of faintness. She was seen by a private physician who told her she had gall-bladder disease and gave her some medicine. However, her condition became worse, she vomited frequently, her eyes became yellow, the epigastric pain persisted, and she became confused. Shortly before admission she became unconscious.

Physical examination on admission revealed a well-nourished, well-developed negress in coma. Her temperature was 99.4 degrees by rectum, her pulse rate 110 per minute, and her breathing was labored. The scleræ were yellow and the skin showed evidence of jaundice. Examination of her heart and lungs was negative except for a soft systolic murmur over the aortic area. The liver was enlarged and extended 4 cm. below the right costal margin. There was some rigidity of the abdominal muscles in the epigastrium. The remaining examination was negative.

Laboratory examination revealed her hemoglobin to be 86 per cent. Her leukocyte count was 5,000 with 92 per cent neutrophiles. Rytz and Kahn tests were negative. Urinalysis showed dark brown urine with two plus albumin, nine to ten red blood cells and two to four leukocytes per high power field. Her icterus index was 60 units, and van den Bergh test gave a prompt direct reaction. A serum amylase test showed 281 Comfort units. Her blood sugar was only 35 mg. per cent, and the carbon dioxide combining power was 42 volumes per cent. The prothrombin level was 76 per cent, and total cholesterol was 236 mg. per cent.

The patient was given glucose intravenously and treated symptomatically. Following the glucose, the blood sugar rose to 220 mg. per cent and she quickly recovered consciousness. She vomited almost continuously during the first twenty-four hours of her admission. Her vomitus during this time was approximately 2,000 c.c. After that, duodenal suction was instituted and a moderate amount of fluid was aspirated which was positive for occult blood, but was negative for bile pigments. The vomitus had a fetid odor. On October 26, her blood urea nitrogen was 52.5 mg. per cent. A stool specimen was obtained with difficulty, and was clay colored. It contained only a trace of urobilinogen. The icterus index rose to 83 units. A twenty-four-hour urine specimen showed bile, but a quantitative urobilinogen determination showed only a trace. She again became comatose. A blood urea nitrogen on October 29 was 155.4 mg. per cent. Her temperature rose to 104.8 degrees and she expired on October 31, the eighth day of her admission and ten days after the onset of her illness.

Dr. Hertzog: This case presents a diagnostic problem and has many interesting features from the laboratory standpoint. We have a forty-two-year-old negress who apparently was well until ten days prior to her death. She was admitted in coma with a history of severe epigastric pain. I imagine acute pancreatitis was considered as a serum amylase test was done. However, the results were within the upper limits of normal. An elevated serum amylase level is very helpful in the diagnosis of acute hemorrhagic pancreatitis. She was jaundiced. Slight jaundice is hard to recognize in a negro. However, her icterus index was 60 and later rose to 83 which represents rather severe jaundice. The findings in the urine and stool were that of an obstructive jaundice. A van den Bergh gave a prompt direct reaction as found in obstructive jaundice. However, we have to keep in mind that in obstructive or regurgitation jaundice, the obstruction may be intrahepatic as well as extrahepatic and often the laboratory is of little help in separating these two types of obstruction. Liver biopsies done with a small trocar, with little discomfort to the patient, may prove useful in these cases. The elevated urea nitrogen was probably extrarenal in nature associated with vomiting and dehydration. Mann showed that after the removal of the liver in dogs, the formation of urea ceases with a resulting drop in the level of urea in the blood. Hence, in severe uncomplicated liver damage, one would expect a drop in blood urea rather than an increase. The amino acids, however, may be increased as the normal deaminization which occurs in the liver is stopped. There is a case reported in the literature where uremia as the result of tubular kidney damage, followed traumatic lacerations of the liver. The relationship between the liver and kidney pathology in this reported case is not clear. Theoretically it would be possible for the kidneys to be damaged by the same toxin that destroys the liver.

Dr. Peppard: I would think of liver disease, although I do not think the story is quite the usual one for acute atrophy of the liver. There certainly is not anything to suggest the diagnosis of pancreatic disease.

Dr. Moosnick: We were unable to get a history of the patient having taken any toxic drugs. The mucous membranes showed no evidence of any burns.

Dr. Hertzog: Dr. Mitchell will now give the autopsy findings.

Dr. Mitchell: The body was that of a well-developed, well-nourished negress. Although the skin

was dark, definite jaundice could be recognized. The peritoneal cavity appeared normal. The liver was flush with the costal edges. The liver weighed 1,600 grams. The capsule was smooth and it had a bright yellow color. On section, the liver was smooth and soft, with a bright yellow color. The centers of the lobules were red. The gall bladder appeared normal and the bile ducts were patent with no evidence of any obstruction. The gastro-intestinal tract appeared normal except for severe superficial erosion of the mucosa in the terminal portion of the esophagus. This did not extend into the stomach. The kidneys weighed 200 grams and 280 grams each. Their surfaces appeared swollen and bile-stained. The mucosa of the urinary bladder was hemorrhagic. The spleen was of normal size. The heart and lungs showed nothing of note other than confluent bronchopneumonia in the lower lobes of the lungs.

Dr. Lofsness: I will show the microscopic slides in this case. Grossly, the liver resembled severe fatty metamorphosis but microscopically one sees severe necrosis of the liver parenchyma. The central portions of all of the lobules are necrotic. Only a few viable liver cord cells are seen at the periphery of the lobules. There is also some bile pigment in these parts of the lobules. A great deal of liver tissue has been destroyed. There is no evidence of repair, bile duct proliferation, or fibrosis. The spleen shows only congestion. This section of the lung shows pneumonia, with fibrin and leukocytes filling most of the alveoli. The glomeruli and blood vessels of the kidneys appear normal. However, it has to be remembered that the glomerular capillaries can leak proteins and give albuminuria from a trivial injury with no histologic changes. Some of the collecting tubules are filled with pink granular material as seen after transfusion reactions. There is no history of any transfusion to account for this. If the substance is hematin, it could be due to hemolysis. The tubular epithelium appears intact.

Dr. Hertzog: The histologic picture in the liver that Dr. Lofsness pointed out to you is typical of acute degeneration of the liver. The term "acute yellow atrophy" is often applied to this type of liver disease. The name is really a misnomer, as frequently the liver is larger than normal and red in color, rather than yellow. Hence the term, acute degeneration, is preferable. The urine in these cases at times may contain leucine and tyrosine crystals. Some of the chronic cases may develop eventually a type of cirrhosis that is difficult to distinguish from the ordinary type of portal cirrhosis. The mild cases that recover are usually called acute catarrhal jaundice. The findings in the kidneys are not sufficient to account for the elevated blood urea nitrogen. The uremia appears largely due to extrarenal factors. The patient vomited a great deal and lost considerable fluid during the first part of her hospital stay. An esophagitis is frequently seen at postmortem in a patient who has regurgitated the acid stomach contents prior to death.

Dr. Moosnick: Does this liver look like those found in severe alcoholism?

Dr. Hertzog: No, in chronic alcoholism the usual finding is a fatty liver.

Dr. Lofsness: Acute degeneration of the liver is an uncommon disease of unknown etiology. Some cases occur during pregnancy, and some are due to drugs such as sulfanilamide, neo-arsphenamine, chloroform and cinchophen. Occasionally it follows extensive burning of the skin or thyrotoxicosis. Many cases, however, such as this one, are not well understood. They tend to occur in younger people, often have an abrupt onset, with no known precipitating factor. The principal lesion is autolysis of the liver. This suggests death or injury of the hepatic cells without inactivation of the intracellular enzymes. Chemicals such as chloroform, toluene and salicylic acid will do this. Substances such as strong acids, phenol and formaldehyde kill cells but also inactivate ferments and consequently fix tissues, preventing autolysis.

On a few occasions, biopsies of the liver have been taken from people with acute hepatitis. The main change is swelling of the liver cells. This narrows the sinusoids, reducing the blood flow, and consequently the oxygen supply. Anoxemia favors acidosis, as seen in an overworked muscle, or excised tissue. Slight acidity will kill cells, as seen in tissue culture. Also, the intracellular pepsin-like enzyme acts best in an acid environment. Inasmuch as the centers of the lobules have the poorest blood supply, they usually are most severely attacked. Recent studies suggest that blood flow in the liver is influenced by valve-like musculature around the sinusoids under nervous control, and this may be concerned.

In any event, the lysed cells liberate protein cleavage products into the circulation, such as albumoses and amines, which are highly toxic. Amino acids are formed, appear in the blood in excess, and are excreted in the urine. Also, the damaged liver is unable to stabilize the blood sugar, so that hypoglycemia occurs frequently. You will recall that our patient entered with hypoglycemic coma. It seems that the malignant course of this disease is due more to the toxins formed by autolysis, and the loss of hepatic function, than to the precipitating toxin.

Anatomic Diagnoses: (1) Acute degeneration of the liver; (2) bronchopneumonia; (3) acute esophagitis; (4) jaundice.

LOWEST DEATH RATE FROM PNEUMONIA REPORTED

The lowest pneumonia and influenza death rate on record among its industrial life insurance policyholders was achieved in the last annual cycle, September, 1941, to August, 1942, the Metropolitan Life Insurance Company announces.

During that period the average pneumonia-influenza death rate was equivalent to 32 deaths per 100,000 persons. This is 21 per cent less than the previous low record made the year before and 63 per cent less than the rate five years before.

Most striking is the change in the picture during the winter months when pneumonia and influenza deaths reach their maximum. During the winter of 1936-1937, considered an average winter at that time, pneumonia and influenza deaths reached an extremely sharp peak in February with a rate of more than 175 deaths per 100,000 persons on an annual basis. At the end of February, 1942, the peak was just over 50 deaths per 100,000 persons on the annual basis. The death rate for the winter months was 70 per cent less than in the winter of 1936-1937, and the seasonal mortality curve has flattened out so as to be "almost beyond recognition."

The life insurance company warns, however, that the continued prevention and control of pneumonia is the concern of every man and woman and that no common cold can be considered lightly. Signs or symptoms of more serious trouble call for prompt medical attention.—*Science News Letter,* December 19, 1942.

THE ASIATIC CHOLERA IN SAINT PAUL

JOHN M. ARMSTRONG, M.D.
Saint Paul, Minnesota

(Continued from December Issue)

The Board of Health made its first report to the Council on June 11. The fact that such a report was made is all that is preserved in print of the activities of that body and this statement in the minutes of the Common Council is the only official record of the cholera in Saint Paul until the succeeding epidemic, which will be taken up later. It must be remembered that it was feared that the fact that cholera existed here might get abroad and deter immigration. Knowledge of the matter was kept as quiet as possible. Immigrants meant business and money, and both were sorely needed here. The Council, then, when receiving reports from the Board, tabled them; thus the report did not appear on the minutes and even the newspapers did not print them and almost ignored their presentation. This attitude of the city government and newspapers in regard to epidemics is still often followed. The report, as I have stated, will not be found in the printed record. Fortunately, through the courtesy of the custodian of the Courthouse some years ago, I came upon the written minutes. Subsequent reports could not be found. The report is as follows:

"The Board found a young man sick on Third Street with the disease which has been prevailing to a moderate extent among immigrants upon the decks of our steamboats, to whom due aid and comfort was administered, and as soon as he was sufficiently recovered to be removed, he was provided with comfortable quarters. He is now very nearly well. A man named ————, an Irishman, in a dying condition when the Board organized, was visited and after death his remains had decent sepulture, through the instrumentality of the Board and Mayor Olmsted. A German of the name of Frederick Altman, was found in a dying condition yesterday morning in the suburbs of the city and was removed to the home of a benevolent citizen nearby where he had the best attention of the inmates of the domicile and the Board while he lived. He died last night and was buried today."

The Board also stated that they had been unable as yet to procure a building for a hospital. Bishop Cretin then made the Board a proposition as follows: "That the city could have the use at reasonable expense, of ample apartments in the hospital now in process of erection under his superintendence as soon as it was finished, which he thought would be by the first of July." St. Joseph's Hospital could not be used, however, and it was imperative that a building be secured at once. The old log chapel of Saint Paul, erected in 1841, at this time being used as a school by the Sisters of St. Joseph, was secured, and shortly after this event, opened as a cholera hospital.

When the steamer *Galena* drew up to the landing in Saint Paul early in the morning of June 16 she had nine ill with cholera aboard, one patient, a cabin passenger, in extremis. He was carried to Doctor Goodrich's office where he expired at 9 a.m. He was a physician named A. Sargent of Meadville, Penn-

sylvania.[2] Most of those who died or who had the disease in Saint Paul were strangers so that their names are not remembered and were in many instances unknown. Saint Paul citizens did not entirely escape. Among the latter was Col. Daniel H. Dustin, United States District Attorney. He was orator of the day on July 4, was taken ill a few days later and died on the tenth at the Winslow House (where the Forepaugh Block now is at Seven Corners). An infant daughter of his died a few days later at the home of Samuel Abbey.[3] On June 19 the fifth death occurred in one family in Upper Town, name unknown, and another member of the family was stricken. On July 25 there were two more deaths, one a Miss Bridgit and the other Dr. Charles Ludwig Vicchers,[4] who contracted the disease from a man he was attending. He lived but five hours after the onset of symptoms. The daughter of The Reverend Van Ingen, rector of Christ's Church, was taken ill with cholera when the steamboat she was on was ascending the river opposite Kaposia. She died a few days later.[5] On July 22 Charles D. Fillmore, a half-brother of ex-president Fillmore, died of dysentery, the papers stated, as no doubt his obituary would be widely circulated. He was stricken with cholera while driving from Saint Paul to Stillwater but managed to get back to town before he died.[6] Three days later a child named Hoffman and a niece of Fillmore's wife died of the same disease. After Fillmore's death, whenever a livery team started out to be gone for several hours it was customary for the livery man to put a bottle of cholera medicine under the seat of the vehicle. The popular cholera medicine among the people was Perry Davis' Pain Killer, a mixture of whiskey, tincture of opium and tincture of capsicum. It was taken internally and also applied to the abdomen. On August 2, two persons, Edward K. May, a prominent merchant, and an unknown woman died. On July 25 the steamer *Galena* again brought cholera patients into the city and several deaths had occurred on the boat on its way up the river. My mother, who came to Saint Paul the last day of July, tells me that a man died of the cholera at the Winslow House shortly after her arrival. He and his wife had just arrived from the South on their wedding trip. Doctor Potts was the man's physician. My mother's aunt, later Mrs. Willis A. Gorman, volunteered to care for the man while my mother endeavored to render consolation to the young wife.[7] A servant in the home of Judge Sherburne was found ill in bed one morning with cholera. Dr. A. G. Brisbine was called. He secured a Sister of St. Joseph to care for her but she died the same evening.[8] There were nine in the Sherburne family and two other servants, but none of them contracted the disease.

Much more, no doubt, could be added to this account, had this investigation been undertaken forty years ago instead of recently. Possibly my mother is the only person now living who has personal recollection of the cholera in Saint Paul in 1854. It would seem that there was considerable more cholera in Saint Paul than most people would now believe, as I certainly have been able to

---

[2]Doctor Sargent was accompanied by his daughter. In October, a Mr. Kennedy came to Saint Paul to take Sargent's body back to Meadville for burial.

[3]Both Dustin and his daughter were attended by a homeopathic physician named Geo. A. Sperry. Sperry left Saint Paul some years later. Samuel Abbey's house was on Fourth Street about where the entrance to the J. J. Hill Library now is. Later the house was removed and is now part of a building at 181 Ramsey Street. Doctor Potts succeeded Sperry and was attending Dustin when he died.

[4]Doctor Vicchers came a year previously. He married a Miss Coulter in Saint Paul. His widow married again and died in about 1912 at Fargo, N. D.

[5]She was returning home from the East where she had been at school. The clerk on the boat named Cochran did what he could for her until Saint Paul was reached. She was buried in the Mission Grounds (now Park Place).

[6]Fillmore was United States Commissioner of Pine Lands in Saint Paul.

[7]My mother was then sixteen years of age. She states that the day the man died, *Harpers Magazine* had just come; Thackeray's "The Virginians" was running in it and she did not get a chance to read it. Later in the year, my grandmother returned to Canada to bring the household goods here. She was taken ill with the cholera at Galena but recovered. Mrs. Armstrong, my mother, died in 1940 at the age of 102.

[8]This was the first time Miss Sherbourne met Doctor Brisbine. She later became his wife.

gather but a portion of the facts. During the year the Common Council passed bills incurred by the Board of Health amounting to $1,046.42, including the salary of $300 of the city physician. The above statements apply to the year 1854. I have several accounts of the disease which may have occurred either in 1854 or 1855, but in most instances the date cannot be definitely fixed. There is reason to believe, however, that the disease was more prevalent in 1855 but there are only two references to it in the newspapers of that year and none in the minutes of the City Council, no doubt for reasons previously stated.

Apparently the epidemic of 1854 caused the editor of the *Minnesota Democrat* to write an editorial on Health and Crowded Boats, the last paragraph of which is as follows: 'We do not wish to be misunderstood at a distance in making these remarks. *There is no sickness in Saint Paul now.* There has been very little on the river. We desire simply to secure the enforcement of proper sanitary regulations in the city and upon steamboats, for the protection of present and future residents and visitors either upon pleasure or business." This was in the issue of April 25, 1855. The warning evidently had its effect, for on May 1, the New City Council elected the following to serve on a Board of Health: P. R. Winne, L. C. Dunn, N. F. Masterson, Isaac Markley, A. H. Cavander, and D. A. Robertson. These men nominated Dr. Samuel Willey for city physician. The nomination was approved by the Council, which also passed a resolution thanking Doctor Goodrich for his previous services.

That the Board at once found work to do is evident, for the next day the following appeared in the *Democrat:*

"A young printer named Daniel E. Berry, from Harrisburg, Pennsylvania, died this morning at the hospital from cholera. Mr. B. came to Saint Paul yesterday on the Ben Bolt from Dubuque. When he was attacked by the cholera, he was turned out of the hotel . . . the sick man laid down on the pavement until his companion secured aid, when he was carried to Doctor Lambert's office, and thence to the hospital."

The editor's indignation at the inhumanity of the hotel keeper was no doubt intensified because Berry came to Saint Paul to work for the *Democrat* The other reference to cholera occurs in the same paper on May 9:

"We announce this evening with feelings of sincere regret the death of Mr. Platt, one of the editors and proprietors of *The Minnesotian.* Mr. Platt expired this morning at his residence in this city of cholera-morbus after an illness of thirty-eight hours . . ."

This was Henry P. Platt. Other sources of information leave no doubt that his demise was due to Asiatic cholera.

I shall now quote two or three interviews of the many I have had with old settlers, which illustrate the manner in which much of this material was obtained and how authenticated. In August, 1915, I had an interview with James Cody, then living on Smith Avenue near Ramsey Street. Cody was illiterate, but had a keen memory. That part of his statement relating to the cholera I give in his own words:

"I came to Saint Paul, May 1, 1854. The cholera was here at its worst in 1854 and 1855. Margaret, my sister, aged twenty-five, died of cholera at St. Joseph's Hospital May 1, 1855. James Farrell died the same week. In 1854, Fillmore went out for a drive into the country and came in and died. At the Cemetery at the Academy grounds (where St. Joseph's Academy now is) was a blackboard where the names of those dying of cholera were written. I counted thirty-four names in two weeks. On a raft on the river where the Wabasha bridge now is, a man died in a short time. In June, 1855, Andrew Welsh

died and willed all to wear a white scarf at his funeral. Dan Welsh died also; he was no relative to Andrew. The cholera was worse in 1855 than in 1854. Doctor Willey was the best doctor we had. Doctor Goodrich was a good doctor. Mary Anne Ireland, half sister to the Archbishop, recovered from the cholera in 1855. Of Tom Farrell's family, James died and Pat recovered. At St. Peter and Summit was a French Catholic Cemetery—a French woman was buried there in 1854. She had cholera. The funeral cost seventy dollars. Many cholera patients died at St. Joseph's Hospital. Bishop Cretin said a committee must help the Sisters, and the night my sister died, many were sick at the hospital. I helped there myself. Doctor Goodrich had charge of the cholera patients in 1854. Every boat that came brought in patients. James Farrell died at Tom Grace's near Park Place. Hannah McQuaid died about the same time at her home on Jackson Street, near Sherries. James Ryan died after breakfast at the same time. In May, Father Tom McManus gave a sermon about a man who brought him word of a sick man aboard the *War Eagle* (a steamboat). The sick man recovered, but the messenger died. Mike De Warn, his wife, and two daughters died of cholera on Eagle Street. ———— Kay, daughter and son, twenty-five and twenty-seven (years of age), were taken sick on Sunday evening and died the next day. Dennis Lynch was digging the cellar of the old Jackson Street Methodist Church and died two hours after. In 1854, Wm. Murnan died of cholera above Lake Pepin on a steamboat, and his brother John died later. I was to a dance on Second Street in 1855, five took it at the dance and three died—Wm. Ryan, Miss Flaherty and Ellen Burke. John Donley, in Reserve township, was taken ill while cutting hay in 1855. Mayor Knowl died at Sixth and Robert Streets in 1855."

I may say that the Dennis Lynch mentioned was the maternal grandfather of the late Thomas J. Maloney, who graduated in the same class as myself at the University of Minnesota. Doctor Maloney's mother confirmed Cody's statement. On July 31, 1915, Mr. Jacob Mathes said:

"I came to Saint Paul in 1852. I remember the cholera in Saint Paul. I can recollect the name of but one man who died of it here. He was a German named Hullsiek. I think it was probably about 1855. I was living in Cincinnati in 1849 and 1850 and also remember the cholera there. Coal fires were lighted at the street intersections as a preventative."

Both these statements are interesting as the German named Hullsiek was John Gabriel Hullsiek, aged twenty-six, the great uncle of the two Drs. Richard and Harold Hullsiek, now in Saint Paul. As to the bonfires on the street corners in Cincinnati I may say that it was a revival of the procedure adopted as a preventive for the bubonic plague in London two centuries before.[9] Mrs. W. D. Richardson told me that she was living in what is now Park Place in 1855. One evening a woman, who lived on what is now Smith, about opposite the Miller Hospital, came to her home and asked that she procure help as her husband was ill. Mr. Richardson was attending a Masonic meeting in the Mouzurkia Hall on St. Anthony and Exchange. Mrs. Richardson went after him. He brought a physician from the lodge meeting with him, but the man died. He was an engineer on one of the steamboats. Mrs. Richardson said that there were many cholera patients in Saint Paul, but this was the only one with whom she personally came in contact. She looked after the woman's baby until after the funeral. She stated that the Board of Health, the Masons, and the clergy cared for many patients. Mr. Richardson was one of the Masonic cholera relief committee.

That there was some cholera in St. Anthony is proved by an item in the minutes of the Board of County Commissioners for July 24, 1854.

"Wm. E———— (writing illegible) attending one cholera case at St. Anthony . . . $10.00. Same . . . attending one cholera case at St. Anthony . . . $10.00."

[9]It may be interesting to state here that the word "bonfire" was originally bonefire; that is, the fire in which the corpses of those who died of plague were cremated.

St. Anthony was part of Ramsey County until 1875. Mrs. Mary A. Fuller, who was Mrs. Samuel Willey, told me that one boat in 1855 brought in eleven cholera patients.[10] They were placed in wagons to be taken to St. Joseph's Hospital (which was in use in 1855). One of the wagons became mired and two patients died before it could be extricated. Mrs. Fuller (nee Irvine) came to Saint Paul as a child in 1843. It is unnecessary to multiply such accounts. Apparently there was little cholera after 1855, though Doctor Wharton told me he saw some patients on the river flats in 1857 or 1858.

In 1866, Saint Paul was again affected by the disease. The history of this outbreak has some amusing features. In April, the City Council ordered the city cleaned up in order to be prepared for a visitation of the disease, and at the same meeting a committee of the Council reported that the Pest House, located on the Poor Farm, had been sold with the rest of the farm and that they were endeavoring to secure a new site with the coöperation of the county. As will be seen, this complicated affairs. It was then discovered that no Board of Health or city physician existed, as none had been appointed since the new city administrators had come in. Thereupon, Dr. A. G. Brisbine was re-elected city physician and his salary fixed at $150.00 per year, a considerable reduction. The Board of Health was then organized with a clerk and a representative from each ward. The Board met on April 18, and set about taking steps to clean up the city as per order of the Council. Earlier in the month, a sanitary police system had been perfected and an order issued, with the acquiescence of the Council, that there be no dumping in the streets, undrained pools of stagnant water in streets and vacant lots should be drained or filled up, no hog pens or soap factories be allowed within the city limits, green hides must not be left on the sidewalks to perfume the air and refuse and garbage must be dumped in the river below the city limits. However, when health ordinances conflict with business interest, political policies often change. The dumping below the city limits was protested against by those handling refuse because of the extra haul, and those who took water from the river for sprinkling the streets joined them saying they were afraid the sprinkling water might be contaminated. The hog owners then protested, claiming that pig pasturing within the city did no harm and pigs acted as efficient scavengers. H. Rogers, who was in the hide business, stated that he had been in the leather trade in Philadelphia in 1832, and that there was no cholera among those in the leather business or even in the vicinity of the warehouses where hides and leather were stored and that such a business was a protection to those engaged in it and to those residing near such business houses. Mayor Prince then refused to sign the sanitary ordinances and the Council did not pass them over his veto. The editor of *The Pioneer,* in an editorial, thanked the Council for their action, stating that "when the hogs were driven out and the hides confined, he could not sleep because he missed the odor, but now that the fragrance was again restored he could secure his normal sleep." The Board of Health thereupon tendered their resignations, but they were not accepted. The members then, except the clerk who drew a salary, did not attend the meetings and practically no Board existed, as no quorum could be obtained. Finally, in June, the resignations were accepted, and in July, Dr. Thomas R. Potts, after some competition with Dr. C. D. Williams, was elected city physician and health

[10]In 1854, that portion of the city bounded by West Fourth Street, St. Peter Street, Pleasant Avenue, and West Ninth Street was swampy. A stream ran down Rice Street and through the grounds of St. Joseph's Hospital and reinforced by waters from springs along Pleasant Avenue there was enough water to turn the wheel of Irvine's Mill at West Third and Franklin Streets. The arched stone tailrace of this mill may still be seen east of the steps heading down the bluff at that point. When one said upper town, one referred to that part west of the swamp and centering about the seven corners, the approach to the upper levee being Eagle Street. Lower town was east of the swamp and corners on Jackson Street, which was the approach to the lower levee. It was in the road through this swamp that the wagon conveying the cholera patients was mired.

officer. In the meantime, the committee of the Council and the county commissioners could not agree and failed to provide a site for a hospital, but it was proposed to locate it in the third ward. This caused a panic in that part of town. A public meeting was then held and addresses were made by various citizens. Doctor Willey stated after the necessity for a cholera hospital had been admitted that "he thought St. Joseph's Hospital the best place; the city had had its cholera patients cared for there when the cholera was here before." Doctor Stewart also advocated this plan as "there was no time to build a cholera hospital and the cholera may break out any day. It had already appeared in Cincinnati and boats may bring it here any moment." Mr. Markoe offered to see what arrangements could be made for the reception of cholera patients at the hospital and report at a subsequent meeting. It was suggested also by Doctor Willey that daily reporting of cholera patients be required and reports of disease and mortality kept. This suggestion was taken up by the newly organized Board of Health and was the first ordinance of its kind in the state. This meeting was followed by a meeting at Timmes Grocery Store[11] of citizens who resided near the hospital and threats were made of burning the hospital if cholera patients were allowed there. It was then suggested that the Dakota House on the west side of the river be secured as a suitable place. Shortly after this meeting, I. P. Wright, chief health inspector, reported that he had rented the Dakota House on the west side of the river, but the residents of that locality had fiercely protested and Mr. Langevin, the owner, had begged him to give up the contract as he apprehended the hotel would be destroyed. So a site was secured at Kaposia. This again was given up for similar reasons. On August 21, the Board reported that they were building a quarantine station at Pig's Eye about a mile below Dayton's Bluff. "Two buildings, one 24 by 30 feet and another 30 by 30 feet, are almost completed, and bedding, stoves, furniture, and medicines will be sent down today." Boats coming up the river were to be required to stop there for inspection. On August 24, Dr. Charles E. Smith, a graduate of the University of Pennsylvania, who had just returned home after serving an internship at "Blockley," was made assistant to Doctor Potts, and placed in charge of the quarantine station. The two buildings cost $1400.

[11]At that time on the southwest corner of Tenth and St. Peter Streets.

(To be continued in February issue.)



Stephen H. Baxter, M.D.

President, Minnesota State Medical Association

President's Letter

A YEAR ago, a new president of our association took office only a few days after the treacherous Japanese attack on Pearl Harbor had precipitated a state of war. Before that attack, the United States was not at war with any nation; since then, our armed forces have been sent on missions of war to all parts of the world. Now, again, comes a change of administration, but it is in no sense a "change of horses in the midst of the stream." Responsibility for administration in our Association rests in a Council of members serving for overlapping terms, and representing every part of the state; but final authority rests in the truly representative House of Delegates. This mechanism provides a continuity of policy for the organization and gives to its elected leaders a sense of confidence and support which they as individuals could not possess. Without this support, any officers assuming positions of leadership in this year of grace, 1943, and approaching the problems with which they will be faced, must necessarily have many misgivings regarding their own adequacy; with it, they can go forward with confidence and assurance.

The nation is at war for its very life and every one of us has already felt the impact of the struggle. The war brings changes in the social and economic structure of the nation which vitally affect us all. Many of these changes will be permanent, for the old order will not return exactly as it was before the war. There are powerful forces at work which would destroy the practice of medicine as it is now conducted and would make the physician a hired employe of a bureaucracy. These forces should be and will be resisted, for experience has shown that scientific medicine reaches its highest development and accomplishes the greatest good for the greatest number of people under a free system unhampered by bureaucratic dictation.

Suppose, however, that the tide is irresistible, and fundamental and radical changes take place in the practice of medicine. The outlook could not be darker than was the outlook for Britain in 1940 when she was threatened with invasion and her cities were being bombed almost to complete destruction. During those darkest days, someone invented the slogan, "There will always be an England." The very repetition of that simple phrase engendered the faith that somehow it would come true, and inspired men to perform the works without which their faith would be dead.

If the threatened changes in medical practice become effective, will we be able to say "There will always be a medical profession?" True, there will always be physicians, for there will always be persons physically and mentally ill who will need the ministrations that only the physician can give, but there are many professions, each with its own ideals and code of ethics. My belief is that, regardless of the changes that may come in medical practice, there will always be a medical profession governed by the traditions of the profession and therefore essentially unchanged because those traditions are based upon principles which are fundamental to the character of the physician and to the best relationship between the physician and the patient. Our organization is one of the strongest forces contributing to the maintenance of that character and those principles, and it must be kept at the highest possible level of efficiency and influence.

With this inaugural expressing faith in the fundamentals of our profession and in the maintenance of its ideals, and with confidence in the future of medicine, the new administration assumes its duties.

Faith, to be vital and effective, must be implemented by works. The first of these works is to be found in the committee appointments. The work of many committees deals with scientific matters, the work of others deals with the relations of the medical profession to the public, and with matters affecting the economic aspects of medical practice. Both are important, and, in the final analysis, they both serve the same end which is to provide the best possible medical care through a well-trained and progressive medical profession. Practically every committee will be faced with problems which originate from, or are complicated by the state of war. The medical profession should take the lead in finding the solutions of these problems. Therefore the committees should attack them promptly and vigorously and have some concrete and well-considered recommendations to present to the annual convention to be held in Minneapolis in May.



President, Minnesota State Medical Association

Editorial

Carl B. Drake, M.D., *Editor;* George Earl, M.D., Henry L. Ulrich, M.D., *Associate Editors*

EARLY DAYS

WITH this issue Minnesota Medicine begins the twenty-sixth year of publication, It must be quite obvious to every member of the Minnesota State Medical Association that the judgment of the House of Delegates in 1917 was sound in principle and fraught with far-sighted wisdom. The journal had its inception with the appointment of a committee at the meeting of 1916, in Minneapolis. This committee consisted of Drs. R. J. Hill and J. Warren Little of Minneapolis, George E. Senkler and E. W. Buckley of Saint Paul, and C. L. Scofield of Benson, with instructions to determine the cost, the probable value of a journal to the society and to the profession as a whole, and to report at the next annual session.

At the 1917 meeting held in Saint Paul, a majority report was submitted, the substance of which was that owing to the existing state of war and the high cost of production it was deemed inadvisable at that time. A minority report submitted by Dr. E. W. Buckley of Saint Paul showing a most complete and careful study of the project was adopted by the House of Delegates. Following this, Doctor Buckley announced an offer of Ramsey County Society to present to the State Association the *Saint Paul Medical Journal* together with its advertising contracts and good will. This journal had had a successful career for seventeen years under the able editorship of Dr. Burnside Foster with Dr. H. Longstreet Taylor as business manager. The offer was promptly and gratefully accepted.

The first issue bearing the title of Minnesota Medicine went to the membership in January, 1918, and evoked many pleasing and gratifying comments. The *Journal of the American Medical Association* gave it a most complimentary editorial.

The first editor was Dr. E. T. F. Richards with Drs. R. E. Farr and J. E. Hynes of Minneapolis, E. W. Buckley and H. L. Taylor of Saint Paul and L. B. Wilson of Rochester constituting the first Editing and Publishing Committee. A contract had been entered into with the Bruce Publishing Company and to the credit of this company be it noted has been renewed at intervals ever since. Mr. J. R. Bruce, from the first issue, has shown a deep personal interest in the journal and frequently attends the meetings of the Editing and Publishing Committee, offering many valuable suggestions, and has in other ways been of inestimable value to the committee. The make-up and typographical work has been a delight to those who have learned to appreciate the fine touches of the printer's art. The artistic appearance of the journal bears testimony to the talent of Miss Olive Seibert, who for a number of years has been in charge of the make-up. In 1919 Dr. Richards resigned as editor and Dr. Carl B. Drake was appointed in his stead, and that he still retains the chair is ample evidence of his ability and perspicuity.

To Dr. John M. Armstrong who served as secretary of the Editing and Publishing Committee for several years and for his valuable contributions to the History of Medicine in Minnesota the Association is profoundly grateful, and to all those who have served and given of their time and talents to so worthy a cause the Association is indebted to a greater degree than they can possibly appreciate.

With the passing of the years we feel assured that Minnesota Medicine will go on to greater fields of usefulness to the State Association and to the profession at large. To the present staff we extend our congratulations and hopes for the future.

J. T. Christison.

GREETINGS FROM THE MEDICAL SCHOOL

THE Medical School of the University of Minnesota is pleased to extend most cordial greetings to Minnesota Medicine on its twenty-fifth birthday. This has been a most significant quarter century in the development of medical education in Minnesota.

From the date of its official opening in 1888, the Medical School of our State University has

enjoyed and profited by the interest and loyal support of the physicians of the state. There were, at times, natural differences of opinion, particularly in the days of the reorganization and expansion of the school, but never was there any fundamental question about the determination of the physicians of this state to have a Medical School of which they could justifiably be proud.

During the past quarter century the Medical School has been able to expand its laboratory and clinical facilities and to enlarge and strengthen its teaching and research staffs. Special gifts have provided clinical, teaching and research units such as the George Chase Christian Memorial Cancer Institute; the Todd Eye, Ear, Nose and Throat Hospital; the Eustis Hospital for Crippled Children; the Psychiatric Clinic for Children, and the Department of Postgraduate Medical Instruction. This latter, which has been conducted in coöperation with the University's Center for Continuation Study, has been a unique and most successful service to the physicians of this state.

Prominent among the responsibilities of a modern Medical School is the conduct of scientific research. To support such research at the University of Minnesota, the State Medical Association joined with the Regents of the University in a request to the legislature for a special appropriation for medical research. This appropriation, which was first voted in 1919 and has been continued annually, has been invaluable in supporting medical research, some of which has resulted in important progress in medical practice and has brought credit to the University and to the state of Minnesota.

In promoting the relationship of the Medical School to the profession of the state, Minnesota Medicine has rendered effective and valuable service. At the present time, the Medical School is concentrating its efforts primarily on war research and on the training of medical students for service with the armed forces in a minimum possible time. During these critical times it is especially important that the Medical School and the profession of the state coöperate most intimately in keeping medicine in Minnesota upon a sound and progressive course. In the attainment of this objective Minnesota Medicine will continue to play an exceedingly important role.

Harold S. Diehl.

TWENTY-FIVE YEARS HAVE PASSED

TWENTY-FIVE years have passed since the first number of Minnesota Medicine appeared in January, 1918. It seems advisable, therefore, to commemorate the occasion by the publication of a special number of the journal devoted to a review of the scientific progress made in medicine during this period. All of the articles in this number were submitted at our request and most of them record the development of the various specialties during this period. A complete portrayal of progress is impossible. The attempt to cover most of the specialties was not entirely successful. We trust that the summary, though incomplete, will prove interesting to our readers.

Minnesota Medicine had its beginning during the last year of World War I. A number of its editorials during its first year consisted of pleas for more enlistments in the Medical Reserve Corps. By June, 1918—fourteen months after our entrance into the war—there were only 15,000 medical men in the service compared to some 40,000 now in the service. Some of the editorials which have appeared the past year resemble those of twenty-five years ago on the same subject of enlistment. Many of the authors who appeared in the first volume are still contributors—evidence that twenty-five years is not such a long period of time after all.

Any success that the journal may have attained is due to the coöperation of the profession of the state. The character of the scientific papers which have appeared in Minnesota Medicine affords some idea of the progress made in medical science during the past twenty-five years. Members have been most coöperative in furnishing editorials when asked. Many members have assisted in the editing of the journal from time to time, in obtaining reviews of articles in the former Progress Section, in writing book reviews and as committee chairmen in furnishing sections such as those of Medical Economics and Industrial Health. No attempt will be made to name them, but they have all made valuable contributions.

The purposes of the journal as outlined in its first editorial were those of the State Medical Association:

To federate and bring into one compact organization the entire medical profession of the State of Minnesota;

To extend medical knowledge and advance medical science;

To elevate the standard of medical education;

To secure the enactment and enforcement of just medical laws;

To promote friendly intercourse among physicians;

To enlighten and direct public opinion in regard to the great problems of state medicine. . . .

The policy of the journal as asserted in its first number was to remain independent, not to be the mouthpiece of any individual or any group and to work only for the best interests of the profession and the public. Advertising was to comply strictly with rules laid down by the Council on Pharmacy and Chemistry of the American Medical Association.

This has been, and continues to be, the aim of the journal. The goal may not have been fully reached but we shall press on with the same purposes in mind.

IMPROVEMENT IN MORTALITY STATISTICS

THAT progress has been made during the past twenty-five years in medicine and in public health is shown by mortality statistics. The experience of the Metropolitan Life Insurance Company,* which closely parallels the vital statistics of the country at large, shows some interesting data.

Deaths from tuberculosis are today about one-fifth of those twenty-five years ago. Measles, scarlet fever, whooping cough, diphtheria, the diarrheas and enteritis have been virtually eliminated as causes of death today. Interesting in this connection are the vital statistics for 1939 in regard to whooping cough, measles and diphtheria. In that year there were 3,026 deaths in the country attributed to whooping cough, 1,174 to measles and 1,993 to diphtheria. While not nearly as serious causes of death in comparison with twenty-five years ago, the statement that these three diseases have been virtually eliminated as causes of death should be somewhat modified.

The mortality of syphilis is today about half of that twenty-five years ago. That from pneumonia has been at least halved. Maternal deaths today are also about half the figure of twenty-five years ago.

The reduction in fatalities due to industry has been outstanding during this period. By contrast the fatalities due to automobile accidents have greatly increased. This perhaps is not surprising when we consider that in 1917 there were only five million automobiles on the roads compared with thirty-three million before gas and tire rationing came into effect. Rationing and a thirty-five-mile speed limit should have a favorable effect on this figure.

*Bulletin of the Metropolitan Life Insurance Company, 23:1, (Mar.) 1942.

THE INCIDENCE OF SYPHILIS

A FEW years ago when venereal disease was brought more into the open and an active campaign to attack the problem was instituted, some assertions were made as to the incidence of venereal disease which at the time were questionable. If our memory serves us correctly we were led to believe that about every tenth individual had, had had, or would have syphilis. To those clinicians in the Twin Cities who were on the lookout for cases of primary syphilis for use as clinical material, this statement certainly did not seem true for Minnesota.

It is, therefore, most interesting to have presented an analysis of the incidence of syphilis as discovered amongst some 1,895,778 selectees and volunteers examined up to August 31, 1941.* The reports on this number are sufficiently complete to warrant analysis and have come from every state in the union except Idaho, Kentucky, Oregon and Vermont.

In brief, 45.3 per 1000 of selectees between the ages of twenty-one and thirty-five in the entire country showed positive or doubtful blood reactions.

Broken down, the figures show an incidence of 17.4 per 1,000 in the white selectees in this age group and 252.3 in the colored.

It is interesting to note how Minnesota stands in relation to the other states. We rank forty-first out of forty-five states listed and have an incidence of 8.6 per 1000 whites in this age group. We also stand thirty-fifth in the thirty-seven states tabulated for negro selectees.

Among white young men in Minnesota between the ages of twenty-one and thirty-five less than 1 per cent have positive blood reactions. While the incidence, according to this article, tends to increase slightly in the older age groups, the incidence in the male white population is probably less than 1 per cent.

*Vonderlehr, R. A., and Usilton, Lida J.: Syphilis among men of draft age in the United States. Jour. A.M.A., 120: 1369, (Dec. 26) 1942.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

"DOCTOR-SHORTAGE"

The phrase "doctor-shortage" is on every editor's mind these days. It has become one of those accepted feature subjects which every publication feels it must cover for its readers. Generally the author is a lay "viewer-with-alarm" or a staff feature writer and seldom, if ever, one of the medical men who have personally struggled with the problem of procuring physicians for the armed forces.

To the latter was given the job of finding and classifying the men who could be spared from their communities for the expanding army. Their job was tremendous; but the anniversary of Pearl Harbor found most of the states with quotas met or exceeded and an orderly procedure established.

That there would be some hardship was a mathematical certainty. That the medical situation in some industrial areas might become acute in spite of every recourse open to Procurement and Assignment was also clearly foreseen.

Procurement's War Job

The point was that there is a war and Procurement and Assignment had a war job to do. The fighting forces had to have doctors and PAS found the doctors. They were also mindful of the need at home and saw to it, in so far as they were able, under the law, that no community was completely stripped of medical service. The need was urgent, the work had to be done quickly; but the problem of medical distribution at home was neither ignored nor overlooked.

Now it has become apparent, even to the casual observer, that the boom towns have medical as well as housing, sanitation and police problems. It is a curious fact, however, that lack of housing and sanitary facilities is accepted with philosophical resignation by Congress and the press. Everybody recognizes that war and not the architects or the lumber dealers or the plumbers are to blame for it. There seems to be little justice or understanding, therefore, in the general disposition to blame the doctors for the inevitable reduction in the number available for medical services in these areas.

Juggling the Bureaus

The critics who demand new agencies and new laws forget that no matter how they juggle the bureaus they will still be dealing with a limited number of men and men who have the same right of preference about where they will work as the welders and riveters. The proposal to lower license standards for the duration of the war might indeed be the answer in exceptional instances; but the general assumption that a poorly trained physician is better than none at all is open to argument even in wartime and the difficulty of revoking special wartime licenses when the war is over must be considered.

The logical answer to the problem has already been made in many isolated communities throughout the country and is being encouraged and implemented on the basis of careful studies by Procurement and Assignment. That is an effective reorganization of the time and services of the doctors who remain at home.

Portland's Answer

That is what physicians of Portland, Oregon, have done, for example, in dealing with the medical problems of the Kaiser plants which in themselves created a monster boom town problem on the Pacific coast. If it could be done there without forced relocation of physicians and sacrifice of licensing standards, it can be done elsewhere. State Committees of Procurement and Assignment are now not merely combing their lists for men who can be spared to fill Army quotas

for 1943 but are carefully studying the civilian situation in their states with a view to just such local readjustments and reorganizations.

Rotation for Rural Communities

In Minnesota the largest concentrations of industrial workers are near the Twin Cities and they are served by the largest concentrations of physicians and hospitals in the state. Consequently there are no typical boom town problems in Minnesota. The greatest difficulty will come in rural areas, now largely drained of all but the minimum number essential for their districts. Those who remain will undoubtedly be operating in the future on a coöperative, rotating basis by which responsibilities for serving some areas will be assumed jointly by all neighboring physicians. Such coöperation has worked admirably where it has been tried and will meet the need more satisfactorily than any hasty licensing of doubtfully trained men.

RHODE ISLAND'S SICK BENEFIT PLAN—FIRST IN U. S.

The first sickness compensation plan to be attempted in any state in the United States goes into effect in Rhode Island this month.

According to an article by John E. Farrell, executive secretary of the Rhode Island Medical Association, which appeared in a recent issue of the *Rhode Island Medical Journal*, the actual background of the act was not employe demand but the fact that a reserve fund of approximately twenty-eight million dollars has been amassed by the state as a result of unemployment compensation taxes. The Unemployment Compensation Board proposed sickness compensation to forestall any demand on the part of employes to eliminate or reduce their tax.

Rhode Island is one of only five states in the country in which employes contribute to unemployment compensation insurance. The three per cent taken from employe wages for this purpose in a highly industrialized state has run into a tidy sum, sufficient to start the sickness compensation plan on a financially sound basis. Moreover, employes are already being taxed one and one-half per cent in addition to pay for the new plan, the entire sickness tax being deducted from employe contributions.

Sizable Reserve

Actually payroll deductions have been made since last June and a sizable fund is in process of accumulation from which benefits will be paid after April 1, 1943.

Labor leaders are reported to have endorsed the plan and it has the blessing and actual support of the Federal Social Security Board. Physicians, upon whom rests the burden of certifying claimants for benefits, were not consulted and they face many vexing problems.

The definition of sickness is very broad in the act. It carries a possibility of certification by other licensed healers besides doctors of medicine and of many questionable claims. The doctor will be placed between the authorities on the one hand, the patient on the other and thus runs the risk of endangering his reputation for integrity or of losing patients.

The solution for this problem suggested by Mr. Farrell is the employment of a qualified medical man by the disbursing agency to certify all claims. This solution is in line with recommendations by the House of Delegates of the American Medical Association.

Federal Government Interested

Most interesting of Mr. Farrell's observations is the close intimate connection which even now exists, he notes, between the Federal Security Agency and the Rhode Island plan. It is provided in the act that any funds which may be made available under title III of the Social Security Act shall be used for administration of the plan. The plan also calls for utilization of present public employment offices throughout the state as administrative offices for the cash sickness compensation fund and such offices are now supported in part by federal funds.

For Local Control

Says Mr. Farrell in conclusion: "Whatever the outcome of the present experiment, it is evident that Rhode Island has a tremendous responsibility to prove that its sickness insurance plan can be carried forward successfully under local control and with local finances."

Rhode Island and other states with sound financial reserves may find it possible to administer sickness insurance successfully. Success will invite imitation elsewhere and it is apparent that federal authorities anticipate eventual participation in administrative control.

INSURING AGAINST THE "THIRD HAZARD"

Most discussions about health insurance are carried on either by professed advocates of government participation or by representatives of the medical profession who, in spite of every wish to be impartial, may be regarded as fundamentally opposed, in general, to plans for socialization of medicine.

It is, therefore, of real interest to have an analysis of the outlook for health insurance in America by a neutral like Mr. Reinhard A. Hohaus of New York who can talk about it without prejudice in relation to the general plan for social security in America.

Mr. Hohaus is an actuary for the Metropolitan Life Insurance Company. He finds that Social Security provisions for old age and for dependent survivors have made a good start along sound lines. On the other hand, basic changes in principle and underlying philosophy are essential to the present plan for unemployment insurance and these should come about before the postwar depression arrives, though the outlook for such developments is not encouraging.

Going Will Be Difficult

Health insurance, he catalogues as the third possible category if the government is to protect against the major hazards of life. But, here, the going will be difficult; the country is unexplored and he earnestly advises against any blind following of precedents for government old age, survivorship and unemployment insurance plans or of government plans adopted abroad.

The situation is confused, the questions to be answered many and even the meaning of the term "health insurance" yet to be determined. Furthermore, health insurance does not, like old-age insurance, permit provision of a basic amount of service on a minimum "social adequacy" level which the citizen may supplement with his own protection. It is highly inadvisable to foster the existence of overlapping systems of care with several doctors replacing one responsible advisor for the individual beneficiary. Also compensation for time lost by reason of illness is regarded by many as of equal importance to insurance for medical services; but the one does not dovetail successfully with the other.

Preventive Medicine Susceptible

The preventive aspect of medicine seems to Mr. Hohaus to be much more susceptible of governmental action than personal medical service. In its more elementary phases including sanitation and epidemic control it is now part of the normal activities of public health authorities. He sees no insuperable obstacle to including more positive functions of maintaining health and well-being at a high level of efficiency, including in these functions, nutrition education and recreation and physical training, no less than immunization and a yearly check-up. "Here, if anywhere," he says, "government does not need to be too meticulous about drawing a line between what is merely adequate and what may be described as additional or supplementary. Positive health promotion of a public or community nature is one field in which an intelligent and non-overlapping mutually beneficial rivalry between government and private enterprise is entirely practicable and of inestimable advantage to all.

Harassed Patient

"New problems arise," he remarks, "if government decides to extend social insurance to the field of health benefits and we are to retain our democrative principle of giving individuals the opportunity of buying additional protection from private sources through their private means. These problems would indicate that, in many cases at least, the function of private health insurance and private medical care should be in the nature of an alternative method of providing the entire coverage which individuals or groups may elect under prescribed conditions, rather than just additional coverage to supplement the basic minimum protection otherwise offered by social insurance. Supplementary medical care, carrying on where the compulsory minimum provisions leave off, would surely often complicate matters and unnecessarily harass the patient by subjecting him to a switch from one system to the other, perhaps at the very time he most needs continuity of treatment. What the effect would be on the quality and effectiveness of the medical treatment is a question for a physician to answer, but I suspect the answer would be far from favorable. When a physician knows that his primary responsibility for a certain case is limited in time or extent or shared contemporaneously with some other physician or physicians, should

we expect his sense of responsibility, of independence and of initiative in the case, or his personal relationship to the patient to be keyed to as high a pitch as it otherwise might?"

Innovations Ahead

On the other hand, Mr. Hohaus, in common with other observers, sees ahead indications of major innovations in medical services.

"The questions posed," he says, "are not simply the pros and cons of extending our present social insurance system to health insurance. A number of signs indicate that, irrespective of what the decision is regarding such an extension, the next few years will see a number of major developments and innovations in the provision of medical care. We are told that about one-third of American doctors and dentists will be in the armed forces by the end of this year. Similar reductions in the civilian supply of nurses and other personnel auxiliary to the medical profession must be expected. . . . Can we safely assume that all temporary measures which may be required because of such shortages will disappear when the war ends? May we not anticipate that experience will show that at least some should be retained permanently?

"Then, too, there will be the exposure of a very large part of the medical profession—especially physicians who have gone from internship to the armed forces—to methods of medical care quite dissimilar in economic and other aspects from the conventional methods of private practice in peacetime. What will their attitude be after peace is won and they and others in military and naval service return to civilian life?"

Modifications Will Be Required

If the broad concept that a minimum of social protection against the hazards of life should be governmentally provided is extended to include medical services, Mr. Hohaus is certain that modifications will be required because of the intimate and personal nature of the services. Here, he says, the role of the Federal government must be one of greater aloofness, confined to assuring that adequate care will be provided, rather than directly participating in the actual provision. Such direct participation would be appropriate only when no suitable agency appears to be available and where choice would seem to lie between a bare minimum governmentally provided and outright charity, or nothing at all.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Physicians Licensed November 13, 1942

October Examination

Armstrong, Wallace David, U. of Minn., M.B. 1937; M.D. 1937, 310 Cecil St. S.E., Minneapolis, Minn.

Arzt, Philip Klaus, Creighton U., M.D. 1937, 2057 Portland Ave., Saint Paul, Minn.

Babb, John William, U. of Western Ont., M.D. 1941, Mayo Clinic, Rochester, Minn.

Baker, Jeannette L., Indiana U., M.D. 1929, Fergus Falls, Minn.

Banner, Edward Arthur, Loyola U., M.D. 1940, Mayo Clinic, Rochester, Minn.

Bechtel, Martin John, U. of Minn., M.B. 1942, Minneapolis General Hospital, Minneapolis, Minn.

Bernstein, Irving C., U. of Minn., M.B., 1942, Ancker Hospital, Saint Paul, Minn.

Black, Albert Seward, Jr., Rush Med. Coll., M.D. 1940, Mayo Clinic, Rochester, Minn.

Blackmore, Sidney Charles, U. of Minn., M.B. 1941; M.D. 1942, Minneapolis General Hospital, Minneapolis, Minn.

Carmona, Manuel Gumersindo, Jefferson Med. Coll., M.D. 1941, Mayo Clinic, Rochester, Minn.

Connolly, Coleman Joseph, U. of Minn., M.B. 1942, Ancker Hospital, Saint Paul, Minn.

Copsey, Harvey Gayle, U. of Neb., M.D. 1941, Mayo Clinic, Rochester, Minn.

Dahleen, Henry Cross, Stanford U., M.D. 1940, Mayo Clinic, Rochester, Minn.

De Vall, Lois Valborg, Rush Med. Coll., M.D. 1941, St. Mary's Hospital, Minneapolis, Minn.

Dougherty, Charles Joseph, Jefferson Med. Coll., M.D. 1938, Mayo Clinic, Rochester, Minn.

Faber, William Max, U. of Wis., M.D. 1938, Mayo Clinic, Rochester, Minn.

Frear, Rosemary R., U. of Minn., M.B. 1934; M.D. 1942, St. Mary's Hospital, Minneapolis, Minn.

Golden, Peter Bernard, U. of Wis., M.D. 1940, Mayo Clinic, Rochester, Minn.

Grant, John Carton, U. of Minn., M.B. 1942, Ancker Hospital, Saint Paul, Minn.

Hawkins, Willian John, Rush Med. Coll., M.D. 1939, Mayo Clinic, Rochester, Minn.

Heinrich, Weston Ackland, Northwestern, M.B. 1941; M.D. 1942, Mayo Clinic, Rochester, Minn.

Heise, Paul von Rohr, Marquette U., M.D. 1941, Minneapolis General Hospital, Minneapolis, Minn.

Heller, Ben Irwin, U. of Minn., M.B. 1941; M.D. 1942, 745 Belgrade Ave. N., Mankato, Minn.

Humphrey, Irving Leslie, Harvard U., M.D. 1940, Mayo Clinic, Rochester, Minn.

Janecky, Allen Gustav, U. of Minn., M.B. 1942, Asbury Hospital, Minneapolis, Minn.

Kirkwood, Roger Tom, Northwestern, M.B. 1942, Minneapolis General Hospital, Minneapolis, Minn.

Kratzer, Guy Livingston, Temple U., M.D. 1935, Mayo Clinic, Rochester, Minn.

Kuhlmann, Lawrence Bernard, U. of Neb., M.D. 1942, St. Joseph's Hospital, Saint Paul, Minn.

Leemhuis, Andrew Joseph, U. of Minn., M.B. 1942, Minneapolis General Hospital, Minneapolis, Minn.

Lemon, Willis Edward, U. of Minn., M.B. 1942, Mercy Hospital, Pittsburgh, Pa.

Long, Gabe Celsor, U. of Ill., M.D. 1938, Mayo Clinic, Rochester, Minn.

Lucking, Bernard Anthony, U. of Minn., M.B. 1941, Minneapolis General Hospital, Minneapolis, Minn.

Metcalfe, Robert Matthew, U. of Colo., M.D. 1940, Mayo Clinic, Rochester, Minn.

Miller, Richard Cramer, Harvard U., M.D. 1941, Mayo Clinic, Rochester, Minn.

Murphy, Michael E., U. of Minn., M.B. 1941; M.D. 1941, Mayo Clinic, Rochester, Minn.

Mussey, Mary Elizabeth, U. of Minn., M.B. 1940; M.D. 1941, Mayo Clinic, Rochester, Minn.

Payne, John Hilliard, U. of Cincinnati, M.B. 1940; M.D. 1941, Mayo Clinic, Rochester, Minn.

Reid, Lewis Miller, U. of Minn., M.B. 1941, Minneapolis General Hospital, Minneapolis, Minn.

Reinecke, Roger M., U. of Minn., M.B. 1940; M.D. 1941, Mayo Clinic, Rochester, Minn.

Ritt, Arnold Elmer Frederick, U. of Ill., M.D. 1932, Minneapolis General Hospital, Minneapolis, Minn.

Roach, Francis Xavier, Jr., U. of Minn., M.B. 1942, Ancker Hospital, Saint Paul, Minn.

Rowe, Clarence John, Jr., U. of Minn., M.B. 1942, St. Joseph's Hospital, Saint Paul, Minn.

Sauer, William George, U. of Cincinnati, M.B. 1939; M.D. 1940, Mayo Clinic, Rochester, Minn.

Scholten, Roger Adrian, Jefferson Med. Coll., M.D. 1937, Mayo Clinic, Rochester, Minn.

Sidell, Richard Huntington, Rush Med. Coll., M.D. 1940, Mayo Clinic, Rochester, Minn.

Simmonds, Frank Lawrence, U. of Minn., M.B. 1941, Minneapolis General Hospital, Minneapolis, Minn.

Spencer, George Norton, Marquette U., M.D. 1942, St. Barnabas Hospital, Minneapolis, Minn.

Stahr, Aubrey Cecil, U. of Minn., M.B. 1938; M.D. 1939; 4528 Fremont Ave. S., Minneapolis, Minn.

Stotler, John Francis, Rush Med. Coll., M.D. 1940, Mayo Clinic, Rochester, Minn.

Turner, Thomas Richard, Baylor U., M.D. 1941, Mayo Clinic, Rochester, Minn.

By Reciprocity

Anderson, Leo Eugene, U. of Neb., M.D. 1941, Mayo Clinic, Rochester, Minn.

Blumgren, John Edgar, U. of Iowa, M.D. 1941, St. Mary's Hospital, Duluth, Minn.

Davis, Edward Valentine, U. of Neb., M.D. 1933, Kirksville, Mo.

Swickard, George Yeagley, Ohio State U., M.D. 1931, Gopher Ordnance Works, Rosemount, Minn.

Watson, Thomas Leonard, Jr., U. of Virginia, M.D. 1930, Gopher Ordnance Works, Rosemount, Minn.

National Board Credentials

Alway, Sophia Chamberlin, Yale U., M.D. 1941, 803 University Ave. S.E., Minneapolis, Minn.

Balfour, William Mayo, U. of Minn., M.B. 1939; M.D. 1940, Mayo Clinic, Rochester, Minn.

Blumenthal, Lester Sylvan, Geo. Wash. U., M.D. 1941, Mayo Clinic, Rochester, Minn.

Manning, John Joseph, U. of Pa., M.D. 1941, Mayo Clinic, Rochester, Minn.

Meyers, Ward Carl, Northwestern, M.B. 1940; M.D. 1941, Mayo Clinic, Rochester, Minn.

Sweeney, Alvin Randolph, Jr., Harvard, M.D. 1939, Mayo Clinic, Rochester, Minn.

White, John Donald, U. of Buffalo, M.D. 1940, Mayo Clinic, Rochester, Minn.

In Memoriam

WILLIAM ANDREW LEE

Dr. William A. Lee, a practitioner at Fergus Falls since 1919, died November 22, 1942, at the age of sixty-three.

Born at Casey, Illinois, October 3, 1879, Dr. Lee attended Central Normal College at Danville, Indiana, where he received a B.S. degree in 1902. He received his medical education at Northwestern Medical School, Chicago, receiving his medical degree in 1911. The following year he served as intern at Mercy Hospital in Davenport, Iowa.

Dr. Lee practiced at Underwood, Minnesota, from 1912 until he entered the army in 1917. After serving eighteen months, part of that time overseas, he joined the medical group with Drs. Baker and Burnap in Fergus Falls. In 1921 he opened an office for himself which he maintained until July, 1942. Because of failing health he then returned to the Fergus Falls Clinic.

He served as city health physician for a great many years and as Otter Tail County coroner for several terms. He was a member of the Elks and Masonic Lodges, a trustee of the Methodist Church, a past Commander of the American Legion and a member of the executive committee of the Boy Scouts for many years. He always took a deep interest in young people and was at one time a teacher and worker in the Methodist Sunday School.

In 1922 Dr. Lee married Lucy Logan Moses of Fergus Falls, who with a son Gordon and daughter Marcella, survives him.

Perhaps Dr. Lee's outstanding characteristic was his cheerfulness which never deserted him even in financial or physical distress. He was also modest but capable in his chosen calling. It is not surprising he had as a result a host of friends. His life is typified by the following tribute to—

The Family Doctor

He walked with modest mien and kindly eye
Along the street, and few would ever guess
That mid the hurrying throngs that surged and pressed
A master soul had passed them gently by.
His smile was such that little children hied
To bask them in its genial wholesomeness;
And when he spake, his words of cheeriness
Shed welcome sunshine like a spring noon sky.
A simple man, yet none in all the land
More great. For he was ever found apart
Where beds of human suffering grimly stand;
And there with soul alert, he lived his art—
The tender gift of healing in his hand,
And God's sweet law of service in his heart.

INDUSTRIAL HEALTH

Edited by the Committee on Industrial Health and Occupational Diseases

A. E. Wilcox, Minneapolis, Chairman

H. B. Allen, Austin
L. S. Arling, Minneapolis
Martin Aune, Minneapolis
Richard Bardon, Duluth
P. H. Bennion, Saint Paul
R. B. Bray, Biwabik
R. P. Caron, Minneapolis
T. H. Dickson, Saint Paul
T. A. Lowe, South Saint Paul
J. L. McLeod, Grand Rapids
C. M. Smith, Duluth
H. G. Wood, Rochester

FOR WORKER HEALTH AND MORALE

Four hundred health directors of leading industrial concerns met recently in Pittsburgh under auspices of the Industrial Hygiene Foundation and seriously discussed a variety of plans for improving the health of their employes.

No longer may employers think only in terms of workmen's compensation. They must also consider good nutrition, morale and adequate medical services, according to these pioneers in better worker health.

Lost time for injuries and illnesses of a non-industrial origin costs the war effort 2,500,000 man-days per week according to the Foundation's council, T. C. Waters of Baltimore. To be successful in the future, Mr. Waters informed the meeting, business enterprise must and will assume more legal responsibility for the health, not only of the workers, but of their families.

Absenteeism Serious

A statistical survey of fourteen industries in 1941 showed 83.1 cases of abstenteeism per 1,000 male workers for eight days or longer; 104.6 cases per 1,000 female workers.

One of the remedies discussed at length by these employers and their health directors was to see that the employe is put on the job to which he is best adapted. "Getting fed up" has considerable to do with absenteeism and ineffectiveness. A management policy which shows its appreciation of the workers' efforts and which provides good physical working conditions was regarded as highly important to worker morale and health.

Food and Production

Periodic physical examinations, diet education and correction (especially among women employes from eighteen to twenty-four) are new to many executives but were regarded by these men as fundamental to an adequate plant health program. The exact relationship of diet to fatigue has not yet been satisfactorily solved; but practical experience in many plants has shown the great value of between-meal refreshments of something other than candy and soft drinks. Milk, soups, sandwiches, fruit have all been used with good effect.

At the meeting, War Manpower Chief Paul V. McNutt predicted that by the end of the year the nation's total labor force will be 59,000,000 of whom 18,000,000 will be in war-production jobs—more than twice as many as a year ago. If the war continues the war-production force will expand to 30,000,000 by the end of 1943.

Services Must Be Pooled

Safeguarding this great army of workers will require all of the ingenuity and coöperative effort of doctors and employers. Physicians whose practices have been limited, heretofore, to industry will need the aid of every other practitioner in industrial communities to cut down absences from illness and protect the workers' families. Pooling of medical services, hospital facilities and nurses will be necessary where war requirements have expanded populations and normal facilities will otherwise break down.

It is obvious that interest in worker health is no longer confined to physicians and health authorities. Employers and business organizations are rapidly awakening to its significance in terms of production and physicians must be ready to respond to that interest.

Employers Adjust Sights

It is also significant that publications devoted to the business and production outlook are now giving space to meetings such as the one held in Pittsburgh. According to *Business Week,* commenting on the matter, employers need to revise their points of view. The editors prophesy that many will be adjusting their sights soon to health insurance plans, with the cost shared by the worker. The fact is that industrial medical services on the insurance plan are not new in the United States, and may be feasible in a few industrial communities. Workers and their families in most cases, however, must depend upon private medical services.

Twenty-five Years Ago

January, 1918

Governor J. A. A. Burnquist has made the following appointments on the State Board of Health to take effect January 17, 1918: Dr. George D. Head, Minneapolis; Dr. Neill M. Watson, Red Lake Falls; Dr. R. C. Hunt, Fairmont.

Governor J. A. A. Burnquist has appointed Dr. C. W. More of Eveleth on the Advisory Commission of the State Sanatorium for Consumptives (*sic*). Dr. H. Longstreet Taylor, whose term expired, has served on the Advisory Commission as its president since the Commission was created by the Legislature in 1903. Dr. Taylor has always been an enthusiast in anti-tuberculosis work. He has been instrumental in establishing fifteen public, one charitable and one private institution and has seen almost 1500 beds dedicated to the consumptive (*sic*) population of Minnesota during his term of office.

February, 1918

Dr. W. A. Coventry of Duluth read a paper on "Toxemias of Pregnancy" at the midwinter meeting of the Upper Mississippi Medical Society held at Brainerd, January 8. Dr. Thomas McDavitt, secretary of the State Association, also spoke on the defense work of the State Association.

Dr. S. S. Shannon, formerly of Barnum, has located at Crosby. He is associated with Drs. B. A. Smith, E. J. Pengelly, and George Gilbert in the Miners Hospital.

At the December, 1917, meeting of the Red River Valley Medical Society, the following officers were elected: President, Dr. H. W. Froehlich, Thief River Falls; vice president, Dr. F. M. Dryden, Crookston; secretary-treasurer, Dr. Ralph L. Kirsch, Crookston.

March, 1918

Captain Ralph St. J. Perry has been placed in charge of the examination of applicants for commissions in the Medical Reserve Corps from the Northwest.

The tuberculosis sanitarium erected just south of Thief River Falls by the counties of Pennington, Marshall, and Roseau, was formally opened to the public on December 31, 1917. The principal address was delivered by Hon. George F. Mathson of Roseau County. Dr. Robinson Bosworth, executive officer of the Sanitarium Commission of the State Board of Control, was present and spoke briefly. The speaker and commissioner referred often to Dr. G. S. Wattam of Warren, to whose work in behalf of tuberculous patients the people of the state owe a great deal.

April, 1918

Naval Station Hospital, Unit No. 10, has been formed in Minneapolis with the following personnel: Clifford E. Henry, grade of surgeon, rank of Lieutenant Commander; Clinton C. Tyrrell, grade of surgeon, rank of Lieutenant Commander; John T. Litchfield, grade of passed assistant surgeon, rank of Lieutenant; J. Arthur Riegel, grade assistant surgeon, rank of Lieutenant (j.g.); William P. Robertson, grade of assistant surgeon, rank of Lieutenant (j.g.).

Dr. J. M. Conroy, late of the City and County Hospital, Saint Paul, has been appointed medical superintendent of Nopeming Sanatorium, near Duluth, Minnesota, to serve during the absence in France of Dr. A. T. Laird.

The following members of the St. Louis County Medical Society have been appointed as the Committee on Arrangements for the next meeting of the Minnesota State Medical Association to be held in Duluth, August 28, 29 and 30: Dr. C. F. McComb, chairman; Dr. W. H. Magie, Dr. W. R. Bagley, Dr. A. H. Schwartz, Dr. C. L. Haney.

May, 1918

Lieut. John S. Abbott, M.R.C., attached to the 18th F.A.B.E.F., is reported in the casualty list of April 15, as missing in action. Dr. Abbott, a practicing surgeon of Saint Paul, received his commission early in June, 1917, and immediately left for France, assigned to the British forces. (Later it was reported that he was a prisoner in Germany.)

The success of Clinical Week under the management of the Hennepin County Medical Society, has been such as to insure that it will be made an annual affair in Minneapolis. Almost 400 physicians from outside the city attended.

Major C. H. Mayo returned April 12 after three weeks' absence in Washington, Fort Oglethorpe and New York.

Major W. J. Mayo departed April 13 for Washington to be absent about three weeks.

June, 1918

Dr. E. W. Buckley, Medical Director of the Knights of Columbus, will leave for France, June 1, to supervise the opening of K. C. huts in the American Army camps in France, England, Ireland and Italy.

Dr. Paul J. Preston writes from Italy thanking the management of Minnesota Medicine for sending the journal to him.

Major L. B. Wilson, Director of the Division of Pathology, Mayo Clinic, and Director of the Field Army Medical Museum, is in France.

The librarians of the Hennepin and Ramsey County Medical Societies will meet in the near future to arrange the distribution of the exchanges of Minnesota Medicine in accordance with action taken by the Publication Committee.

The following physicians from Minnesota attended the meeting of the medical section of the National Council for Defense at Washington, D. C., May 4 and 5: Dr. W. H. Magie, Duluth; Dr. W. L. Palmer, Al-

bert Lea; Dr. H. M. Workman, Tracy; Dr. J. W. Little, Minneapolis; Dr. Thomas McDavitt, Saint Paul; Dr. H. P. Ritchie, Saint Paul, and Dr. H. L. Taylor, Saint Paul.

July, 1918

Lieut. Theodore H. Sweetser of Minneapolis has been recommended for the British War Cross for bravery and devotion to duty near Passchendaele on March 13. Though suffering from poison gas, he helped rescue men from a destroyed dugout.

Dean Wulling and his co-workers in the College of Pharmacy, University of Minnesota, during the past year prepared 28,000 half pint bottles of tincture of digitalis. This constitutes the complete supply of the drug used in the United States Army. A large part of the drug was raised in the medical garden of the college.

Word has been received from Major J. S. White of Saint Paul of his safe arrival overseas. (He was later promoted to rank of Lieutenant-Colonel.)

August, 1918

Dr. Alexander R. Colvin of Saint Paul has been commissioned a major in the medical reserve corps.

Dr. Ernest T. F. Richards, Saint Paul, has been appointed Acting Chief of the Department of Medicine, University of Minnesota, during the absence of Dr. L. G. Rowntree, who has been commissioned a lieutenant-colonel in the national Army.

Thirteen University of Minnesota Medical School seniors, on their way to France, received their diplomas aboard ship. They are members of Base Hospital, Unit No. 26, and were the first class from the University to get their collegiate degrees on the high seas.

A dispatch from the Associated Press announces under date of July 18 that the government is about to assume control of the entire medical profession in the United States to obtain sufficient doctors for the fast growing Army, and at the same time to distribute those remaining to the localities or services where they are most needed for civilian work.

At its regular meeting, July 9, the State Board of Health created a Division of Child Conservation (later changed to Division of Child Welfare), and appointed Dr. E. J. Huenekens of Minneapolis as director. Two nurses, who are experienced in public health work, have been employed by the Board for field work in this division.

September, 1918

Word comes to us that Lieut. Stanley R. Maxeiner of Minneapolis, who has been with the British Expeditionary Forces for the past year, has devised a splint for the temporary care of fracture of the humerus, et cetera.

Dr. P. M. Hall of Minneapolis took Dr. George W. Beach's place as superintendent of the State Tuberculosis Sanatorium at Walker, August 1.

October, 1918

At the annual meeting of the Minnesota State Medical Association held at Duluth, August 28, 29 and 30, Major John D. McLean, secretary of the general medical board of the National Council of Defense, was one of the principal speakers . . . His subject was "Medical Reserve Corps and Volunteer Service Corps." . . . Col. Reuben Miller of the Surgeon General's office decribed conditions that obtain in the Army for medical men.

Lieut. R. C. Lowe of Fairmont, Minnesota, who has been at home on leave, has been appointed a flight surgeon and hereafter will devote his time to caring for Uncle Sam's fliers. He is now stationed at Wilbur Wright Field, Dayton, Ohio.

The present address of Captain Stephen H. Baxter, M.R.C., Minneapolis, is 60th Infantry, A.E.F., France.

November, 1918

Dr. Nellie Barsness, the first woman physician in Saint Paul appointed to overseas war service, left for New York . . . expecting to sail at once for France, where she will serve in the new hospital for the treatment of gassed soldiers established by the American Women's Suffrage Association.

Lieut. Felix John Traxler and Miss Marie Fitzgerald were married at San Antonio, Texas, on August 31. Lieutenant Traxler is a graduate of Creighton University and up to the time of his entering the service practiced at Henderson, Minnesota.

December, 1918

Dr. Henry Wireman Cook, Minneapolis, has been called to Washington to serve for six months as associate director of the Medical Service Bureau of the American Red Cross.

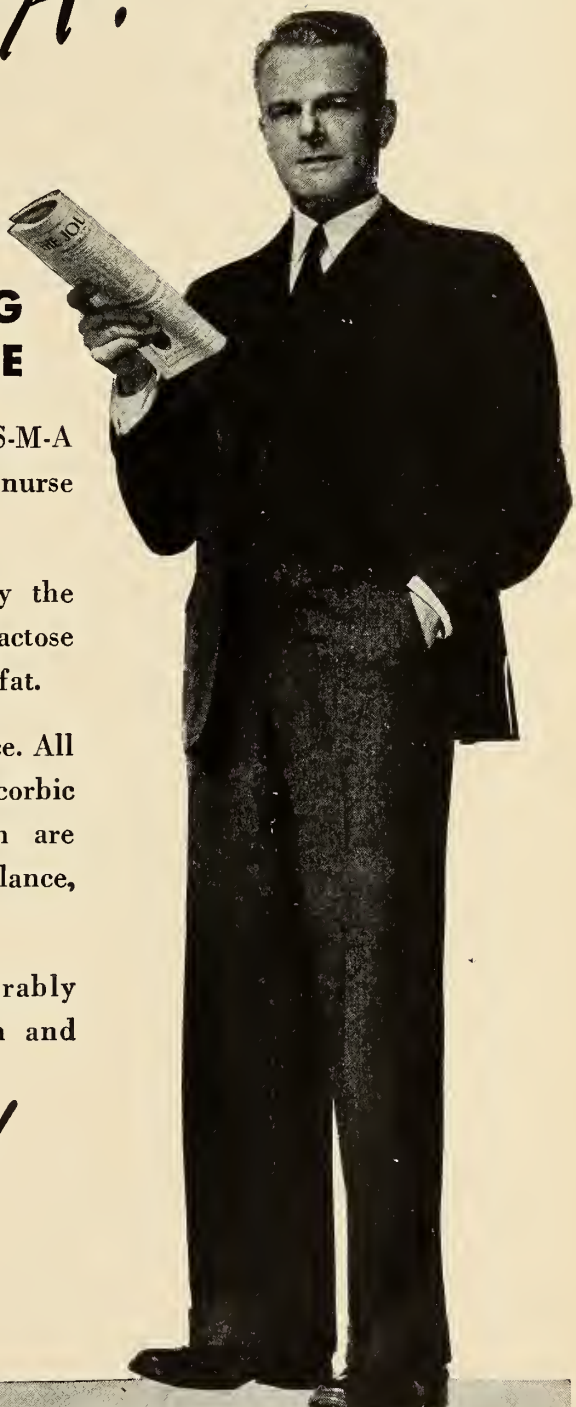
Dr. F. C. Rodda of Minneapolis left a few weeks ago for New York, expecting to leave soon for France where he will take up Red Cross work in children's hospitals behind the battle lines.

Owing to the epidemic of influenza and to the great number of physicians in service the executive committee of the Southern Minnesota Medical Association decided not to hold their annual session as planned on November 25 and 26.

Dr. E. M. Jones, Saint Paul, now stationed at Walter Reed Hospital, Washington, D. C., has recently been promoted to the rank of major.

ZEMMER
Write for Literature
PRESCRIBE OR DISPENSE ZEMMER PHARMACEUTICALS
Tablets, Lozenges, Ampoules, Capsules, Ointments, etc. Guaranteed reliable potency. Our products are laboratory controlled. Write for catalogue.
Chemists to the Medical Profession MIN-1-43
THE ZEMMER COMPANY • OAKLAND STATION • PITTSBURGH, PENNSYLVANIA

*I like S-M-A!**



IN INFANT FEEDING ...IT SAVES MY TIME

- Directions on how to mix and feed S-M-A can be explained to the mother and nurse in two minutes.
- S-M-A is more easily digested by the normal infant because of the all-lactose carbohydrate and the unique S-M-A fat.
- With S-M-A nothing is left to chance. All the vitamin requirements, except ascorbic acid, together with additional iron are included in S-M-A in the proper balance, ready to feed.
- S-M-A fed infants compare favorably with breast-fed infants in growth and development.

Prescribe S-M-A!

ACCEPTED AMERICAN MEDICAL ASSN. Council on Foods
SMA
REG. U.S. PAT. OFF.

*S-M-A, a trade mark of S.M.A. Corporation, for its brand of food especially prepared for infant feeding—derived from tuberculin-tested cow's milk, the fat of which is replaced by animal and vegetable fats, including biologically tested cod liver oil, with the addition of milk sugar and potassium chloride; altogether forming an antirachitic food. When diluted according to directions, it is essentially similar to human milk in percentages of protein, fat, carbohydrate and ash, in chemical constants of the fat and physical properties.

S. M. A. CORPORATION • 8100 McCORMICK BOULEVARD • CHICAGO, ILLINOIS

✦ Reports and Announcements ✦

MEDICAL BROADCAST FOR JANUARY

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Saturday morning over Station WCCO, Minneapolis and Saint Paul, and at 11:30 o'clock over Station WLB, University of Minnesota. Speaker: William A. O'Brien, M.D., Director of Postgraduate Medical Education, Medical School, University of Minnesota.

January 2—Blood and Blood Substitutes
January 9—Hemorrhage and Shock
January 16—Treatment of Burns
January 23—Blood and Blood Substitutes in Chronic Illness
January 30—Bleeding Gums

CONGRESS ON INDUSTRIAL HEALTH

The fifth annual Congress on Industrial Health, sponsored by the Council on Industrial Health of the A.M.A., will be held on Monday, Tuesday and Wednesday, January 11-13, 1943, at the Palmer House in Chicago. These meetings are open to physicians and others interested in industrial health. Various phases having to do with prevention and treatment of diseases and conditions associated with industry will be participated in by the Council on Pharmacy and Chemistry and the various sub-committees of the Council on Industrial Health. On the last day Nutrition of Industrial Workers will be the subject of a round-table discussion to be followed by a conference on industrial health under the joint auspices of the Chicago Medical Society and the Illinois Manufacturers Association.

UROLOGY AWARD

The American Urological Association offers an annual award "not to exceed $500" for an essay (or essays) on the result of some specific clinical or laboratory research in urology. The amount of the prize is based on the merits of the work presented, and if the Committee on Scientific Research deem none of the offerings worthy, no award will be made. Competitors shall be limited to residents in urology in recognized hospitals and to urologists who have been in such specific practice for not more than five years.

The selected essay (or essays) will appear on the program of the forthcoming meeting of the American

(Continued on Page 130)

INTRODUCTORY OFFER

"OVA-ESTRIN"
(Estrogenic Extract)
10,000 International Units per c.c.

Manufactured by
HOSPITAL LIQUIDS CO.

Per 15 c. c. vial, $4.25

1 VIAL **FREE** WITH THE PURCHASE OF 2 VIALS.

On this basis your cost is 19c per c.c.

ENDO LIVER EXTRACT
(Injectable)
For intramuscular use.
Purified Solution of Liver U.S.P.
Each c.c. represents 10 injectable units.

10 c.c. Vial—100 U.S.P. Units

Only $2.75

For a limited time—One 10 c.c. Vial **FREE** with the purchase of 3 Vials.

Accepted by the
Council on Pharmacy & Chemistry of the A. M. A.

C. F. ANDERSON CO INC.

901 Marquette Avenue **ATlantic 3229** **Minneapolis, Minn.**

Write for Prices in Quantities

PYOKTANIN SURGICAL GUT

Plain and Formalized

Manufactured Since 1899 by

The Laboratory of the Ramsey County Medical Society

Packaged dry in hermetically sealed glass tubes in accordance with the new requirements of the U. S. Pharmacopœia.

• • •

Price List

PLAIN TYPE A NONBOILABLE
AND
FORMALIZED TYPE C NONBOILABLE

Sizes.....000 — 00 — 0 — 1 — 2 — 3
28 inches.....per dozen strands $2.00
60 inches.....per dozen strands $3.00

Special discount to hospitals and to the trade. Cash must accompany the order.

• • •

Address

LABORATORY RAMSEY COUNTY MEDICAL SOCIETY

Lowry Medical Arts Building, St. Paul, Minnesota

FOR SALE BY SURGICAL DEALERS AND DRUGGISTS

Congratulations—
Minnesota Medicine

—for your 25 years of service to the Minnesota Medical Profession.

We're "Old-Timers," too!

For 46 years we have been serving the Medical Profession of the Northwest —in the scientific construction and correct fitting of

ARTIFICIAL LIMBS AND ARMS—BRACES—TRUSSES—SUPPORTERS —ELASTIC HOSIERY



The recognized high standard of BUCHSTEIN Service is the result of exacting conformity to professional specifications, the outstanding skill of BUCHSTEIN workmen and the use of only finest quality materials. This assures greater comfort and service to the patient and greater confidence in the doctor's recommendation.

BUCHSTEIN SERVICE IS DEPENDABLE

BUCHSTEIN-MEDCALF CO.

610 Third Ave. So. Minneapolis, Minn.

UROLOGY AWARD

(Continued from Page 128)

Urological Association, May 31-June 3, 1943, Hotel Jefferson, St. Louis, Missouri.

Essays must be in the hands of the Secretary, Dr. Thomas D. Moore, 89 Madison Avenue, Memphis, Tennessee, on or before March 1, 1943.

WAR SURGERY MEETING

To fill the need for inspiration and information with regard to the war medical problem, the American Academy of Orthopedic Surgeons and the Clinical Orthopedic Society have combined their annual meeting to meet this challenge. This joint meeting will be held on January 17, 18, 19 and 20, 1943, at the Palmer House in Chicago. The keynote of this occasion will be "War Surgery" and its application to civil practice. Those members of the medical profession in good standing, who are interested in bone and joint surgery and its allied fields, may have the privilege of attending.

There will be four sections of interest connected with this program:

1. A clinical program.
2. A general scientific assembly.
3. An instructional section
   (a) Group discussion courses.
   (b) Motion pictures of surgical methods and technique.
4. Scientific exhibits.

The speakers and faculty are drawn from the leading surgical authorities of this country, as well as distinguished guests from England, Canada, South America and the Hawaiian Islands. These will include a sizable group of Army and Navy Surgeons who have had to deal directly with the war casualties from across both oceans.

Thorough, concise, short discussion courses will be offered on the following subjects. Each will have an outstanding faculty, many of whom are in military service.

I. Surgery of the Hand
II. Fractures
III. Peripheral Nerve Injuries
IV. Amputations
V. Lame Backs
VI. Surgery of the Hip
VII. Surgery of the Knee
VIII. Burns and War Plastic Procedures
IX. Foot Disabilities
X. Differential Diagnosis of Bone Pathology
XI. Reconstructive Surgery Following Trauma of the Upper Extremity
XII. Surgical Anatomy

Several special features in connection with the general program include:

A. An afternoon devoted to "Complicating Trauma Associated with Orthopedic Casualties." This will include a discussion of the following subjects:

1. "Shock—Its Early Recognition and Treatment."
2. "Blast, Crush and Compression Injuries."
3. "Thoracic Injuries."
4. "Head and Spine Injuries."
5. "Gunshot Injuries to Abdomen."
6. "Injuries to Genito-Urinary Tract."

B. One evening devoted to the subject of "Chemotherapy in the Treatment of Wounds," with eminent authorities who have studied the subject from various angles.

C. Another evening given to a debate on "The Kenny Treatment for Anterior Poliomyelitis."

There will be no time for play. Morning, afternoon and evening will be devoted entirely to the problems as they have been outlined. As has been stated previously, members of the medical profession who are interested in such a program are welcome to attend, and may receive an invitation by writing to the secretary, Dr. Myron O. Henry, 401 Medical Arts Building, Minneapolis, Minnesota. Hotel and railroad reservations should be made early.

ST. LOUIS COUNTY MEDICAL SOCIETY

Dr. Walter E. Hatch of Duluth was elected president-elect of the St. Louis County Medical Society at its annual meeting held at the Kitchi Gammi Club, Duluth, December 10. Officers who will have Society matters in charge this year are: President, Dr. Carl O. Kohlbry, Duluth; vice president, Dr. Henry E. Binet, Grand Rapids; secretary-treasurer (reëlected), Dr. R. P. Buckley, Duluth. Dr. R. J. Manley, Duluth, was elected delegate to the State Association meeting, with Dr. Robert D. Bray, Biwabik, as alternate.

Committee appointments for the year are as follows:

Advisory—Dr. P. G. Boman, Duluth.

Judiciary Committee—Dr. Robert D. Bray, Biwabik; Dr. D. L. Tilderquist, Duluth; Dr. E. L. Tuohy, Duluth.

Economics Committee—Dr. L. A. Barney, Duluth; Dr. F. H. Magney, Duluth; Dr. J. A. Malmstrom, Virginia.

RAMSEY COUNTY MEDICAL SOCIETY

At the annual meeting of the Ramsey County Medical Society in December, the following officers were elected to serve for the coming year: President-elect, Dr. John H. Lepak (who will take office in 1944); president, Dr. W. R. McCarthy; vice president, Dr. Justus Ohage; Dr. Joseph M. Ryan, secretary-treasurer.

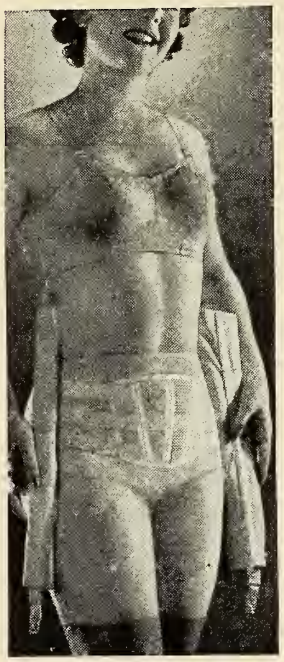
RENVILLE COUNTY MEDICAL SOCIETY

At the annual meeting of the Renville County Medical Society held December 1 at Olivia, Minnesota, Dr. J. A. Cosgriff of Olivia was elected president for the coming year. Dr. A. M. Fawcett of Renville was elected vice president, and Dr. R. E. Billings of Franklin, secretary.

The meeting followed a dinner served by the Home Economics department of the Olivia high school. Twenty-eight physicians and their wives were in attendance. Dr. A. E. Sohmer of Mankato was the principal speaker.

HAVE YOU PATIENTS

With Any Of These Conditions?



Spencer Abdominal Supporting Corset shown open revealing inner support. This is a SEPARATE section, adjustable to the corset section and the patient's figure by means of flat tapes that emerge on outside of corset.

Hernia?

Enteroptosis with Symptoms?

Sacroiliac Sprain or other Back Injury?

Spinal Arthritis or Sciatica?

Postoperative Conditions?

Maternity or Postpartum Conditions?

Breast Problems?

When you prescribe a Spencer Support you are assured it will meet your specific requirements and the patient's figure needs, *because* it will be individually designed, cut and made for the one patient who is to wear it.

Every Spencer Support is individually designed for the patient of non-elastic material. Hence, the support it provides is constant, and a Spencer can be—and IS—guaranteed NEVER to lose its shape. Spencer Supports have never been made to *stretch to fit;* they have always been *designed to fit.* Why prescribe a support that soon loses its shape and becomes useless before worn out? Spencers are light, flexible, durable, easily laundered.

For service, look in telephone book under "Spencer Corsetiere" or write direct to us.

SPENCER *INDIVIDUALLY DESIGNED*

Abdominal, Back and Breast Supports

SPENCER INCORPORATED,
137 Derby Ave., New Haven, Conn.
In Canada: Rock Island, Quebec.
In England: Spencer (Banbury) Ltd., Banbury, Oxon.

May We Send You Booklet?

Please send booklet, "How Spencer Supports Aid the Doctor's Treatment."

.....M. D.

Address .....

What Is Your Profession?

MEDICINE	BUSINESS
12 hour day	Uncollectible Accounts
Hospital Bed Shortage	Taxes
Nurse Shortage	War Bonds
Draftee Examinations	Office Expenses
Military Service	Property Problems

☆

The problems of the man of medicine are many. During this trying period you won't have the time for personal attention to your collection problems. Let us carry this burden for you. Instead of adding to your expense, you'll be money ahead in the long run because we'll collect more money by having your accounts now while more of them are still collectible. If you are soon to enter military service, ask us about our very attractive "military service plan."

☆

Congratulations to Minnesota Medicine on its 25th Anniversary

MINNEAPOLIS CLINICAL ASSOCIATION

Established 1922

The Exclusive Collection Service in the Medical Arts Building

204-207 Medical Arts Building — BRidgeport 1151-2-3-4

Member: National Association of Medical-Dental Bureaus, an organization composed exclusively of the accredited medical-dental collection associations throughout the United States.

WASHINGTON COUNTY MEDICAL SOCIETY

Officers for 1943 were elected at the annual meeting of the Washington County Medical Society, held December 8, 1942, in the old Stillwater Clubrooms. The new officers include the following: President, Ray George Johnson, Minnesota State Prison; first vice president, Carnot H. Sherman, Stillwater; second vice president, George McCue Ruggles, Forest Lake; secretary-treasurer, E. Sydney Boleyn, Stillwater; delegate, E. Sydney Boleyn, Stillwater; alternate, Wade R. Humphrey, Stillwater; censors, J. W. Stuhr, Stillwater, E. V. Strand, Bayport, and R. J. Josewski, Stillwater.

WOMAN'S AUXILIARY

Mrs. Raymond J. Josewski, *President*
Stillwater, Minnesota
Mrs. W. H. Rucker, *Publicity Chairman*
Minneapolis, Minnesota

East Central

The East Central Auxiliary met at Cambridge December 1. Members and their husbands were dinner guests at the State Epileptic Colony. Following the dinner the ladies retired to the apartment of Mrs. D. E. McBroom where the business meeting was conducted by the president, Mrs. A. B. Roehlke. Twelve members were present.

The Auxiliary decided to keep up the state membership dues of the members of the district whose husbands are in the service.

Goodhue County

The highlights of the October meeting of the Goodhue County Medical Auxiliary included decisions to aid the Christmas Seal Sale, support the Women's Cancer Control Association, pay dues of all members whose husbands were in service and send a round-robin letter to them. Hostess for the meeting was Mrs. V. Nordholm of Ellsworth.

Hennepin County

Thirty-two members of the Hennepin County Auxiliary folded literature and placed Christmas Tuberculosis Seals in 24,250 envelopes on November 9 at the tuberculosis county headquarters. Following came the annual sale at Dayton's of handiwork of the Glen Lake tuberculosis patients, continuing for three days. Great appreciation is due Dayton's for giving the space and use of charge accounts and to Mrs. J. A. Myers, who so ably managed the sale. A sum of $1,537.75 was realized for articles sold, the entire amount going directly back to the patients.

On November 16 Mrs. James A. Johnson, president, gave a tea for wives of men in service of Base Hospital No. 26 and others. One hundred twenty-five invitations were sent, the executive board receiving guests with Mrs. Johnson.

Sarahurst is a boarding home for discharged Glen Lake patients without homes of their own to return to. Each year in December a meeting in the form of a Silver Tea for the Home's benefit is given by the Hennepin County Auxiliary. This year the $36.80 donated will be divided among the girls occupying the Auxiliary's room.

The program consisted of Christmas carols sung by the group under Mrs. Gilbert Seashore's direction and a very interesting discussion of China's educational system by Mrs. Walter Judd.

Mower County

Mrs. H. B. Allen was appointed Auxiliary Bond and Stamp Chairman of the Women's Division of the War Savings Staff at the meeting of the Auxiliary to the Mower County Medical Society in December at the home of Mrs. B. J. Cronwell, Austin.

This was the first Austin organization to give active support to the staff which plans to mobilize America's 43,000,000 women behind the war bond program. Members voted to study home nursing as a unit and the rest of the afternoon was devoted to reviewing the history of the Auxiliary.

The meeting was preceded by a dessert luncheon. The group will meet again on the fourth Monday in January at the home of Mrs. L. A. Flanagan, Austin.

Renville County

The Renville County Medical Auxiliary held its December meeting on Tuesday, the first, in the Olivia High School. The Home Economics class served a delicious dinner at 6:30 after which Dr. A. E. Sohmer of Mankato gave a short lecture on "Medical Ethics."

The women then adjourned to their meeting room for the annual Christmas Party. Mrs. J. A. Cosgriff of Olivia and Mrs. Ralph Erickson of Hector furnished the entertainment.

Rice County

Mrs. Adolph Hanson, president of Rice County Auxiliary, reports their group has organized a Surgical Dressing Unit for the Red Cross in Faribault and is conducting it with the help of outside groups. Individual members of the Auxiliary have had charge of nutrition and home nursing classes. All social activities for the year have been suspended due to the extra effort being made by all members to coöperate in every way with the war effort.

St. Louis County

At the annual rummage sale of the St. Louis County Auxiliary held November 17 in Duluth, $171.60 was realized.

Mrs. M. A. Nicholson was hostess for the November card party and guests were the wives of interns of St. Luke's and St. Mary's Hospitals.

INSURANCE ESPECIALLY DESIGNED FOR PHYSICIANS

Protection designed for physicians. Health and accident policies without frills, giving substantial protection cost only $2.00 per policy paid up in full to the middle of June, 1943.

Thirty-seven years of successful service has earned highest rating in the Insurance Digest for financial stability and loss paying record.

Write for Application

Minnesota Commercial Men's Assn.

Paul Clement, Secretary

2550 PILLSBURY AVENUE **MINNEAPOLIS, MINNESOTA**

Announcing . . .

ELECTRONIC MODEL RADIOEAR released from the laboratories of one of America's oldest hearing aid manufacturers and pioneers in vacuum tube hearing aids.

The modern vacuum tube Radioear is small, neat, convenient. No disturbing distortion or noise. Includes the newest scientific developments in hearing aid design and offers you true, balanced tone quality—INDIVIDUALLY fitted. FREE TESTS. This is completely serviced at all times in our Minneapolis office.

MADE FOR USE WITH AIR OR BONE CONDUCTION
BOTH IN CRYSTAL AND MAGNETIC TYPE

YOUR PATIENTS WILL RECEIVE OUR PERSONAL SERVICE
We employ no agents or salesmen

"A DAWN OF A NEW DAY" BOOKLET IS YOURS FOR THE ASKING

Northwest Authorized Distributor

ROY E. SWANSTROM HEARING AID COMPANY
200-202 Medical Arts Building **Minneapolis—Br. 8988**
Batteries and Service for All Types of Hearing Aids

Communication

Duluth, Minnesota,
December 2, 1942

To the Editor:

As a member of the Saint Louis County League for Planned Parenthood, I would like to answer the communication of Theodore H. Sweetser, M.D., in your September issue, in which he criticizes the exhibit of this organization at the meeting of the Minnesota State Medical Association in Duluth, June 29, 30 and July 1. In his letter to you, he quotes at length from an article in a magazine called *America*, condemning birth control and I assume the author's ideas are substantially his.

Had Dr. Sweetser more than "noticed" this exhibit last summer, had he talked to the registered nurse in charge in order to inform himself about the Planned Parenthood clinic, he might have learned why a large number of his colleagues endorse pregnancy-spacing services, medically prescribed under circumstances of blindness, insanity, transmissable disease, subnormality and dire poverty, exhibited in the slums of New York and in the "migrant villages" now in California. He might also have learned that there is no question of "race suicide" involved, since women desiring sound contraceptive information must have at least one child, must be referred to the clinic by a doctor or by a social agency. In fact the reverse is the case, for high annual abortion figures and traffic in injurious contraceptives are a menace to human health and life. The national organization, the Planned Parenthood Federation of America, has received from physicians 35,000 requests for copies of its manual "Techniques of Conception Control."

May we suggest that Dr. Sweetser and the author of the article read recent articles in *Look* Magazine, entitled "Parenthood, U.S.A." showing what a service of medically prescribed contraceptives has done in South Carolina (where it is part of the state health program) and in other parts of the country. The negro family units of eighteen and twenty blind, diseased, rickety children pictured (before birth control) hardly represent "the daring and adventurous spirit that has made America" which the author of the quoted article says is jeopardized by birth control.

Quoting further from the article Dr. Sweetser submits, "Far from being a progressive and triumphant" movement . . . birth control is a cringing thing . . ." may I point out that a movement started a comparatively short time ago by one courageous woman against a barrage of public opposition, which has grown into a large national organization with thirty-two state organizations and 806 clinics giving baby-spacing advice to parents, with a membership of leading doctors, clergymen, sociologists, educators and economists *can* be called just that—"progressive and triumphant!"

(Mrs. Wm. H.) Genevieve J. Pryor

Note: The above has been read and approved by Dr. Elizabeth C. Bagley and Dr. W. E. Hatch, both of Duluth.

Of General Interest

Dr. Harold Hullsiek and Florence Allen, both of Saint Paul, were married December 11, 1942.

* * *

Dr. W. O. B. Nelson of the Fergus Falls Clinic has been appointed city health officer, succeeding the late Dr. W. A. Lee.

* * *

Dr. W. W. Brown of Minneapolis has moved to Grove City, Minnesota, where he will practice medicine, occupying the office suite of Dr. Julius Y. Feinstein.

* * *

Dr. B. F. Osburn of International Falls has taken over the practice of Dr. Charles E. Stafford at Beaudette, Minnesota, while Dr. Stafford is in Army service.

* * *

Dr. Carl J. Lund of the Estrem Clinic, Fergus Falls, has been appointed county coroner to fill the unexpired term of the late Dr. W. A. Lee.

* * *

Dr. Charlotte J. Morrison of Minneapolis has been elected county physician of Hennepin County. She is the first woman to serve in this capacity in the county. A graduate of the University of Minnesota medical school in 1934, Dr. Morrison specialized in diseases of children and later took postgraduate work in public health at Harvard University.

* * *

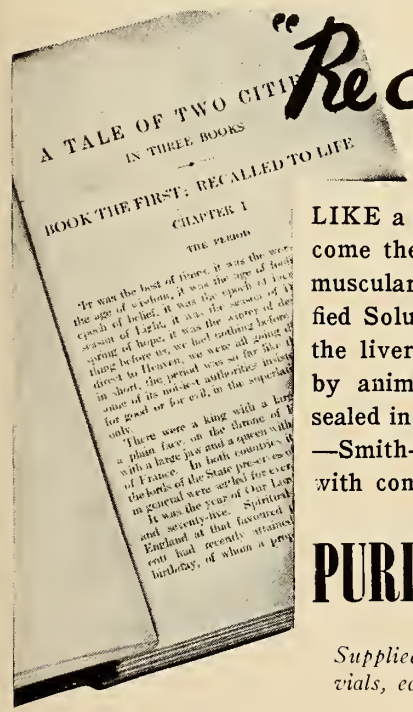
A mobile x-ray unit for use in anti-tuberculosis work in Saint Louis County will be purchased with the proceeds of the Christmas seal sale this year, through sponsorship of various service clubs, civic, business, farm and labor groups in the county. Part of the $15,000 required to purchase the unit was raised last year.

* * *

Dr. V. M. Baich, formerly of Saint Paul, is now a member of the staff of the Itasca Clinic at Bovey, Minnesota, taking the place of Dr. J. C. Feuling, who recently went into service in the United States Navy. Mrs. Baich, a registered nurse formerly associated with the Earl Clinic in Saint Paul, will have charge of the technical and laboratory work at the Clinic.

* * *

Dr. Harlan Nelson, formerly of Brooten, Minnesota, but recently a resident of Los Angeles, was killed in an automobile accident near Braham, Minnesota, early



"Recalled to Life"

LIKE a call to renewed life for the pernicious anemia patient, come the latest developments in liver therapy. . . . For intramuscular injection, Smith-Dorsey has prepared a U. S. P. Purified Solution of Liver containing all the fraction G (Cohn) of the liver extract. Rigidly standardized . . . twice tested by animal injection to prevent local tissue reaction . . . sealed in ampoules and vials . . . finally tested for sterility —Smith-Dorsey offers a product to which physicians can turn with confidence.

PURIFIED SOLUTION of LIVER

Supplied in 1 c.c. ampoules and 10 c.c. and 30 c.c. ampoule vials, each containing 10 U.S.P. Injectable Units per c.c.



The Smith-Dorsey Company

LINCOLN ❖ NEBRASKA

Manufacturers of Pharmaceuticals to the Medical Profession since 1908

Western Electric
HEARING AIDS

YOUR EARS
ARE OUR BUSINESS

DESIGNED

by Bell Telephone Laboratories—pioneer and world leader in speech and hearing research.



FREE

Demonstration and audiometric hearing test. Individually fitted. Bone or air conduction.

WESTERN ELECTRIC HEARING AIDS GIVE YOUR PATIENTS THE NEXT THING TO NORMAL HEARING

330 THIRD FLOOR MEDICAL ARTS BLDG.

Visit or Call Us at Our
—New Location—

Phone ATlantic 7593

AUDIPHONE CO.
330 Medical Arts Bldg., 825 Nicollet Ave., Minneapolis, Minn.

in December when his car hit a stretch of loose gravel. Dr. Nelson was only thirty-five years of age. He had spent five years on the resident staff of the General Hospital, Minneapolis, before going west. He had returned to Minneapolis recently to join the Navy as a surgeon.

* * *

Dr. Irvine McQuarrie, professor of pediatrics, University of Minnesota Medical School, delivered three addresses November 3 and 4, in the twelfth Porter Lectureship in Medicine at the University of Kansas School of Medicine. On November 3 he spoke at the Kansas City branch on "Experiments of Nature and the Advancement of Medical Knowledge." On November 4 he spoke at Lawrence on "Medical Experiences in Besieged China," and that night again at Kansas City on "Diseases of Adrenal Glands in Children."

* * *

A portable fracture bed to be housed at Marshall, Minnesota, for use of residents in Marshall, Minneota, Tracy, Milroy, Amiret, Balaton, Burchard, Tyler, Cottonwood, Florence, Garvin, Ghent, Green Valley, Lynd, Russell, Taunton, Granite Falls, Clarkfield, Echo, Wood Lake, Hanley Falls, Hazel Run and surrounding rural areas will be purchased with funds raised in a special campaign sponsored by the American Legion Auxiliary in Marshall this year. Previous campaigns sponsored by this group have placed at the disposal of this area an infant incubator and an inhalator.

* * *

Col. James O. Gillespie of Denver, Colorado, a war prisoner in the Philippines, has been awarded the Distinguished Service Medal, the highest non-combat decoration of the Army, for developing hospitals on besieged Bataan with only extremely limited resources in personnel and equipment. A native of North Dakota, Colonel Gillespie graduated from the Medical School of the University of Minnesota, interned at Fitzsimmons Hospital, Denver, was transferred to Honolulu in 1930 and to Manila in 1940. Colonel Gillespie is a brother of Dr. M. G. Gillespie of Duluth. His wife and two sons are at present in Denver.

* * *

Minnesota physicians who appeared on the program of the annual meeting of the Radiological Society of North America, in Chicago, November 30 to December 4, 1942, included the following:

C. Allen Good, Rochester: Intussuscepting Lesions of the Small Intestine.

John D. Camp, Rochester, in collaboration with Leo A. Nash, Fargo, North Dakota: Developmental Thinness of the Parietal Bones.

Leo G. Rigler, Minneapolis: Infected Cyst of the Lung.

Robert E. Fricke, Rochester, in collaboration with P. N. Pastore, Richmond, Virginia: Radium Treatment of Hypertrophied Lateral Bands of the Pharynx.

Eugene T. Leddy, Rochester: Roentgen Therapy for Bronchiogenic Carcinoma.

Wm. C. MacCarty, Rochester: Panel Discussion on Treatment of Carcinoma of the Larynx; Pathology.

* * *

A Gift to Meeker County Tuberculosis Program

A new precedent in donations to public health work was created last month when Mr. J. W. Bryant of 3011 N.E. Ulysses Avenue, Minneapolis, formally presented a gift of $500 to the work of the Committee on Tuberculosis of the Minnesota State Medical Association.

The money is to be used specifically for the Meeker County tuberculosis control project of the committee and constitutes the first lay gift of this type on record anywhere for use in epidemiological work.

Behind the gift is an unusual story which was told to the committee by Mr. Bryant at the meeting. He was himself found to have an unsuspected active tuberculosis last January, he said, as a result of routine tuberculin tests and chest radiograms made of all employes of the Northern Pump Company of Minneapolis, of which he is an official. Treatment included a successful collapse of the affected lung and Mr. Bryant was back at work with a minimum loss of time. The method by which his condition was discovered and the speed and effectiveness of his treatment profoundly impressed him. His gratitude took the form of the gift to the Meeker County program because that program also aims to find unsuspected cases through routine use of the tuberculin test and x-ray on an area basis in the general population.

The gift was accepted by the committee with the approval of the Council and will be used, it was announced, in accordance with the wishes of the donor, to help finance the county-wide tuberculosis survey of Meeker County. The program of the committee is modelled in essentials upon the program of the veterinarians for the control of tuberculosis among cattle. The demonstration in Meeker County is coupled with an accreditation plan by which any county measuring up to standards set by the committee may be accredited by joint action of the Minnesota State Medical Association and the Minnesota Department of Health.

"I realize," Mr. Bryant told committee members, "that the problem of arresting tuberculosis in the individual is a minor one in comparison with the larger problem of controlling it in the general population. I have no words to express my admiration for you and the Meeker County doctors in your attempt to create a working model here for the control of tuberculosis."

Mr. Bryant was made an honorary member of the committee at this meeting.



For Better Service
Recommend
The
Apothecary Shop
"Saint Paul's Prescription Store"

- Biologicals
- Prescriptions
- Pharmaceuticals
- Dressings
- Physicians' Supplies

THE APOTHECARY SHOP
Frank W. Moudry, Prop.
5th & St. Peter — Saint Paul
Cedar 0571



Home of the Auditorium and Library of the Ramsey County Medical Society

Lowry Medical Arts Buildings

4th Street Section

Saint Paul Minnesota

Physicians in Service

Dr. Stuart Lane Arey of Excelsior, Minnesota, reported for duty at Quantico, Virginia, in December as a lieutenant in the United States Navy.

Dr. Philip Rains Beckjord of Willmar, now serving with the United States Army, has been promoted to the rank of Major in the Medical Corps. He is at present holding the position of Executive Officer in a Medical Battalion at Camp Van Dorn, Mississippi.

Dr. N. O. Monserud, a member of the Raiter Hospital staff at Cloquet, Minnesota, is in training at San Antonio, Texas, having received his commission as first lieutenant in the United States Army in November.

Dr. George Olds of Waseca, a captain in the Air Corps, is stationed at George Wright Field, Spokane, Washington. Dr. Olds has been assigned to an engineers battalion and is preparing for foreign service.

Commander Irwin Norman, University of Minnesota graduate in the class of 1928, has joined the staff of General Douglas MacArthur's command as fleet surgeon of the Southwest Pacific fleet. In that position he will be in charge of all medical activities in the area for the United States Navy. In taking his new post in the Southwest Pacific Commander Norman will complete service which will have taken him almost around the world. It will be recalled that he was a member of the Harriman-Beaverbrook mission to Moscow and Kuibeyshev, Russia, last year. Commander Norman visited his parents, Mr. and Mrs. August Norman, at Willmar, en route to his new post.

Disabilities occasioned by war are covered in full.

86c out of each $1.00 gross income used for members benefit

PHYSICIANS CASUALTY ASSOCIATION
PHYSICIANS HEALTH ASSOCIATION

Hospital, Accident, Sickness

INSURANCE

For ethical practitioners exclusively

(57,000 Policies in Force)

LIBERAL HOSPITAL EXPENSE COVERAGE	For $10.00 per year
$5,000.00 ACCIDENTAL DEATH $25.00 weekly indemnity, accident and sickness	For $32.00 per year
$10,000.00 ACCIDENTAL DEATH $50.00 weekly indemnity, accident and sickness	For $64.00 per year
$15,000.00 ACCIDENTAL DEATH $75.00 weekly indemnity, accident and sickness	For $96.00 per year

40 years under the same management

$ 2,220,000.00 INVESTED ASSETS
$10,750,000.00 PAID FOR CLAIMS

$200,000 deposited with State of Nebraska for protection of our members.

Disability need not be incurred in line of duty—benefits from the beginning day of disability.

Send for applications, Doctor, to

400 First National Bank Building Omaha, Nebraska

REMEMBER—

our complete line of trusses, supporters, and elastic wear when you next prescribe these appliances. We are also equipped to provide orthopedic braces.

A registered nurse and an experienced fitter supervise the department.

BROWN & DAY, INC.

St. Paul, Minnesota

Dr. E. K. Ingebrigtson of Moorhead, Minnesota, has received his commission as captain in the medical corps and has reported for duty in the United States Army Air Base at Santa Ana, California.

Members of the Mayo Foundation now on extended active service include the following: J. W. Babb, Royal Canadian Air Force; R. W. Bratt, Lieutenant, M.C., American Air Force, United States Army; C. R. Johnson, Lieutenant, M.C., United States Army; W. W. Lindahl, Lieutenant, M.C., United States Army; C. P. Marvin, Lieutenant (jg), M.C., United States Naval Reserve; J. T. Nix, Lieutenant, M.C., United States Army; D. L. Paulson, Captain, M.C., United States Army; T. T. Perry, Lieutenant, M.C., United States Army; E. T. Rulison, Lieutenant, M.C., United States Army; J. T. Shelden, Captain, M.C., United States Army; H. J. Svien, Lieutenant (jg), M.C., United States Naval Reserve; F. R. Whitehouse, Lieutenant, M.C., United States Army; C. L. Yeager, Captain, M.C., United States Army.

Members of the Mayo Clinic Staff now on extended active service are: P. W. Brown, Major, M.C., United States Army; G. J. Thompson, Lieutenant Commander, M.C., United States Naval Reserve.

* * *

Hospital News

Miss Edna Wolfe of St. Peter has been named superintendent of the St. Peter Community Hospital, succeeding Miss Eda Roberts, who is now in Brookings, South Dakota. Miss Wolfe will be assisted in conducting the hospital by Mrs. William Francis who will

Effective, Convenient and Economical

THE effectiveness of Mercurochrome has been demonstrated by twenty years' extensive clinical use.

For the convenience of physicians Mercurochrome is supplied in four forms—Aqueous Solution for the treatment of wounds, Surgical Solution for preoperative skin disinfection, Tablets and Powder from which solutions of any desired concentration may readily be prepared.

Mercurochrome

(H. W. & D. Brand of dibrom-oxymercuri-fluorescein-sodium)

is economical because solutions may be dispensed at low cost. Stock solutions keep indefinitely.

ACCEPTED AMERICAN MEDICAL ASSN. Council on Pharmacy and Chemistry

Mercurochrome is accepted by the Council on Pharmacy and Chemistry of the American Medical Association.

Literature furnished on request

HYNSON, WESTCOTT & DUNNING, INC.

BALTIMORE, MARYLAND

Cook County Graduate School of Medicine

(In Affiliation with Cook County Hospital)

Incorporated not for profit

ANNOUNCES CONTINUOUS COURSES

SURGERY—Two Weeks' Intensive Course in Surgical Technique starting January 11 and 25, February 8 and 22, and every two weeks throughout the year.

MEDICINE—One-Month Course in Electrocardiography and Heart Disease starting the first of every month, except August.

FRACTURES AND TRAUMATIC SURGERY—Formal and Informal Courses.

GYNECOLOGY—Two Weeks' Intensive Course starting April 5; Clinical and Diagnostic Courses.

OBSTETRICS—Formal and Informal Courses.

OTOLARYNGOLOGY—Two Weeks' Intensive Course starting April 19. Clinical and Special Courses.

OPHTHALMOLOGY—Two Weeks' Intensive Course starting April 5.

ROENTGENOLOGY—Courses in X-ray Interpretation, Fluoroscopy, Deep X-ray Therapy every week.

UROLOGY—Two Weeks' Course and One-Month Course available every two weeks.

CYSTOSCOPY—Ten-Day Practical Course every two weeks.

General, Intensive and Special Courses in All Branches of Medicine, Surgery and the Specialties.

TEACHING FACULTY — ATTENDING STAFF OF COOK COUNTY HOSPITAL

Address: Registrar, 427 S. Honore St., Chicago, Ill.

PROFESSIONAL PROTECTION

SINCE 1899 SPECIALIZED SERVICE

In addition to our Professional Liability Policy for private practice we issue a special

MILITARY POLICY

to the profession in the Armed Forces at a

REDUCED PREMIUM

THE MEDICAL PROTECTIVE COMPANY OF FORT WAYNE, INDIANA

WAUKESHA SPRINGS SANITARIUM



BUILDING ABSOLUTELY FIREPROOF

FOR THE CARE AND TREATMENT OF

NERVOUS DISEASES

BYRON M. CAPLES, M. D., Medical Director
FLOYD W. APLIN, M. D.
WAUKESHA, WIS.



REST HOSPITAL

A quiet, ethical hospital with therapeutic facilities for the diagnosis, care and treatment of Nervous and Medical cases. Invites coöperation of all reputable physicians who may supervise the treatment of their patients.

PSYCHIATRISTS IN CHARGE
Dr. Hewitt B. Hannah
Dr. Joel C. Hultkrans

2527 2nd Ave. S., Minneapolis, Phone At. 7369

Complete Optical Service

LENS GRINDING
DISPENSING
CONTACT LENSES
EYE PHOTOGRAPHY

N. P. Benson Optical Co., Inc.

Established 1913
Main Office: Minneapolis, Minn.
— BRANCHES —
Aberdeen - Duluth - Eau Claire - Winona
Bismarck - La Crosse - Wausau - Stevens Point
Albert Lea - Rapid City

be in charge of the obstetrical ward, and by the regular staff of nurses and assistants. Miss Wolfe received her nurses' training at Hillcrest Hospital, Minneapolis, and was affiliated with the Minneapolis General Hospital and the Covell and Community Hospitals in St. Peter as a nurse before her appointment by the hospital board.

* * *

A general letter has been sent by the State Board of Control to superintendents of all state institutions asking that poisonous drugs and similar substances be confined strictly to drug storerooms and kept separate from any items of food. This is being done as a precaution in averting any such tragedy as occurred recently in a state hospital at Salem, Oregon, with the death of forty-seven inmates, whose food had been contaminated with roach powder.

The Elizabeth Kenny Institute, occupying the building at Eighteenth Street and Chicago Avenue, Minneapolis, was formally dedicated with appropriate ceremonies, Thursday, December 17. A dinner in Sister Kenny's honor was given after the ceremonies at the Nicollet Hotel.

* * *

At the annual meeting of the St. Cloud Hospital medical staff in December officers for the ensuing year were elected as follows: President, Dr. H. B. Clark; vice president, Dr. J. B. Gaida; secretary, Dr. P. L. Halenbeck. The chiefs of the departments will retain their offices for the coming year. The Executive Committee of the staff during the coming year will consist of the following members: Dr. H. B. Clark, chairman; Dr. J. B. Gaida, Dr. P. L. Halenbeck, Dr. J. B Beuning, Dr. C. F Brigham, and Dr. W T. Wenner

* * *

Dr. Bert W. Caldwell, executive secretary of the American Hospital Association for fifteen years and editor of *Hospitals* since its establishment seven years ago, has resigned and will devote his time to special projects and to his farm in Shirland, Illinois. His resignation was accepted by the Board of Trustees with an expression of a deep feeling of appreciation of Dr. Caldwell's many years of loyal and devoted service.

* * *

"Doctors at War," a radio drama presented by the A.M.A. and the National Broadcasting Company in cooperation with the United States Army and Navy, will be heard each Saturday at five o'clock P.M. over the NBC network. The program which began December 26, 1942, will continue through June, 1943.



The Birches Sanitarium, Inc.

2391 Woodland Avenue

Duluth, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Psychiatrists in Charge

L. R. Gowan, M.D. A. S. Nissen, M.D.



VOCATIONAL HOSPITAL

. . . An integral part of the Miller Vocational High School offers two special features—Patients receive a maximum of personal attention from student practical nurses—All food is prepared under the direction of a qualified dietitian. Patients remain under the care of their own physicians.

Director of Nurses—M. H. WOLTMAN, R.N., B.S.

Superintendent & Dietitian—H. B. BROWN, B.S.

Physicians may secure services of Vocational nurses by calling Nurses Headquarters and asking for a Vocational Nurse

Bridgeport 2281

5511 South Lyndale - - Minneapolis



Largest Orthopedic Manufacturers in the Northwest

SPECIALISTS!

Extension Shoes and Clubfoot Corrections . . . Abdominal and Arch Supports . . . Braces for Deformities . . . Elastic Stockings . . . Expert Truss Fitters . . .

•

Seelert Orthopedic Appliance Company

88 South 9th Street

Minneapolis MAin 1768

Send us your slow collection items.

All accounts made by personal calls.

We specialize in Medical and Dental Accounts.

Bonded and Licensed Under Minnesota State Laws

Northwestern Adjustment Co.

518 Bremer Arcade Bldg.

St. Paul Minnesota

DANIELSON MEDICAL ARTS PHARMACY, INC.

PHONES:
ATLANTIC 3317
ATLANTIC 3318

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

HOURS:
WEEK DAYS—8 to 7
SUN. AND HOL.—10 TO 1

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.

414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.

INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS

MAIN 2494

Radiation Therapy Institute

of Saint Paul

CHARLES T. MILLER HOSPITAL



Treatment Room

Facilities for Radium and Roentgen Therapy, Including Million Volt Constant Potential Installation of Most Advanced Design.

You are cordially invited to visit the Radiation Therapy Institute and inspect its facilities

Edward Schons, M.D., *Director* **J. P. Medelman, M.D., *Associate Director***

When Other Modalities Fail . . .

Treatment of constipation by mechanical means may prove effective

If habit-forming laxatives and cathartics have proved inadequate or are not tolerated, sometimes mechanical means will restore normal bowel tone. As an adjunctive treatment these dilators have proved of value also in the therapy of hemorrhoids by elimination of constipation, relieving congestion of blood and establishment of vigorous circulation. Not advertised or sold direct to the laity. Write for brochure.

DR. YOUNG'S RECTAL DILATORS

Set of 4 graduated sizes, $3.75 per set—available for your patients at ethical drug stores or order from your regular surgical supply house.



F. E. YOUNG & CO.
422 E. 75th St.
Chicago, Illinois

CLASSIFIED ADVERTISING

FOR RENT—Physician's office, 3801 Nicollet Avenue, Minneapolis. Three rooms, laboratory and waiting room formerly occupied by prominent physician for twelve years. S. A. Otness, 5341 Clinton Avenue, Minneapolis, Minnesota. Telephone: COlfax 7017.

* * *

EXPERIENCED LABORATORY and x-ray technician desires position in doctor's office in Minneapolis or vicinity. Available February first. Address D-41, care MINNESOTA MEDICINE.

BUY WAR SAVINGS STAMPS

AND BONDS

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.
414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.
INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS
MAIN 2494

SAVE TIME!
TRY DAHL'S
Biologicals Dressings
Pharmaceuticals Surgical Instruments
Hypodermic Medications
Day and Night Service
Joseph E. Dahl Co.
Incorporated
ATlantic 5445 82 So. 9th St., Mpls.

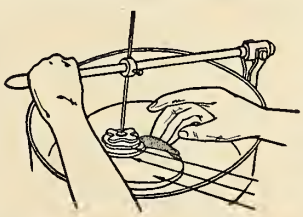
Radiological and Clinical
Assistance to Physicians
in this territory
MURPHY LABORATORIES
Minneapolis: 612 Wesley Temple Bldg. - - At. 4786
St. Paul: 348 Hamm Bldg. - - - - - - - Ce. 7125
If no answer, call - - - - - - - - - - Ne. 1291

Orthopedic Braces and Appliances
Physicians' specifications followed precisely.
Scientific manufacture and fitting.
AUGUST F. KROLL
Manufacturer
230 WEST KELLOGG BLVD.
St. Paul, Minn. CE. 5330

Hall & Anderson
PRESCRIPTION PHARMACY
BIOLOGICALS
PHYSICIANS' SUPPLIES
SAINT PAUL, MINN.
LOWRY MEDICAL ARTS BUILDING
TELEPHONE: CEDAR 2735

HOME LOANS
- At Lowest Interest Rates
- Easy Monthly Payments
- We Also Make FHA Loans

NORTHWESTERN FEDERAL SAVINGS AND LOAN ASSN.
823 Marquette Avenue
Foshay Tower
MINNEAPOLIS, MINN.
"A Friendly Institution"

UNUSUAL LENS GRINDING

CATARACT, MYO-THIN and other difficult and complicated lenses are ground to extreme thinness and accuracy by our expert workmen.
ARTHUR F. WILLIAMS
SAINT PAUL
MINNESOTA

Save 25 to 40 Per Cent
Druggists' Mutual Insurance Company
OF IOWA, ALGONA, IOWA
Fire - Tornado - Automobile Insurance
Prompt Loss Service
Minneapolis Branch—S. E. STRUBLE, 835 Palace Bldg.
Home Office—Algona, Iowa



Three of the units

Glenwood Hills Hospitals

3501 Golden Valley Road
Hyland Station
Route Seven

For Nervous Disorders

OPERATED IN CONNECTION WITH HOMEWOOD HOSPITAL

A modern hospital for nervous disorders, built on the cottage plan. The buildings are located on elevated land, affording beautiful views on all sides. Glenwood Hills Hospitals have all the advantages of rural surroundings, and are still only a few minutes by automobile from the Minneapolis loop.

An Invitation

The facilities of these institutions are available for all reputable members of the medical profession.



HOMEWOOD HOSPITAL

Corner Penn and Plymouth Avenues North
Minneapolis Minnesota

Board of Directors

A. P. McGlynn
Mrs. Stanley V. Hodge
Rev. John A. Dunphy
A. G. Stasel
Rome B. Gross
Rev. J. A. O. Stub
Fletcher Olson
Raymond T. Raskop
Stanley Kane
Helen Swenson Raskop, R.N.

Officers

A. P. McGlynn, *President*
A. G. Stasel, *Vice President*
R. T. Raskop, *Secretary*
Rome B. Gross, *Treasurer*

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 **February, 1943** **No. 2**

Contents

TUBERCULOSIS OF THE EYE.
F. H. Haessler, M.D., Milwaukee, Wisconsin..... 161

MODERN METHODS OF CONTROL FOR MEASLES, SCARLET FEVER AND DIPHTHERIA.
Archibald L. Hoyne, M.D., Chicago, Illinois..... 167

THE TOXEMIAS OF PREGNANCY.
John A. Haugen, M.D., Minneapolis, Minnesota.. 171

USE OF THE SULFONAMIDES IN PREGNANCY.
Melvin B. Sinykin, M.D., Minneapolis, Minnesota 173

OBSTETRICS IN THE HOME.
E. S. Palmerton, M.D., Albert Lea, Minnesota.. 176

THE MANAGEMENT OF OCCIPITOPOSTERIOR POSITIONS.
William C. Keettel, M.D., Madison, Wisconsin... 179

ECTOPIA CORDIS.
H. J. Prendergast, M.D., Saint Paul, Minnesota.. 182

EMBRYOLOGY AND GENETICS IN ECTOPIA CORDIS ABDOMINALIS.
F. C. Schuldt, M.D., Saint Paul, Minnesota..... 184

CLINICAL-PATHOLOGICAL CONFERENCE.
Presentation of a Case.
A. J. Hertzog, M.D., and *S. V. Lofsness, M.D.* 190

HISTORY OF MEDICINE IN MINNESOTA.
The Asiatic Cholera in Saint Paul (Concluded)
John M. Armstrong, M.D., Saint Paul, Minnesota 192

History of Medicine in Dodge County.
James Eckman, Rochester, Minnesota, and *Charles E. Bigelow, M.D.,* Dodge Center, Minnesota 194

PRESIDENT'S LETTER..... 196

EDITORIAL:
War and Disease..... 197
Doctor, Save Our Mileage!..... 198

MEDICAL ECONOMICS:
Planning for the Future of Medicine..... 200

Medical and Hospital Obstetric and Pediatric Care for Wives and Infants of Men in Military Service 201

Minnesota State Board of Medical Examiners.. 202

INDUSTRIAL HEALTH:
Fitting Workers to Their Jobs..... 204

MINNESOTA ACADEMY OF MEDICINE:
Meeting of October 14, 1942..... 205

The Medical Management of Peptic Ulcer. (Abstract).
Moses Barron, M.D., Minneapolis, Minnesota.. 205

The Surgical Management of Peptic Ulcer—A Chemical Problem (Abstract).
O. H. Wangensteen, M.D., Minneapolis, Minnesota 206

Meeting of November 11, 1942..... 208

Harry Parks Ritchie *(In Memoriam)*..... 208

Malignant Melanomas of the Uvea and Their Prognosis.
Frank E. Burch, M.D., Saint Paul, Minnesota.. 208

Prognosis of Malignant Melanomata of the Uvea from the Standpoint of Pathogenesis, Cytology and Fiber Content.
Walter E. Camp, M.D., Minneapolis Minnesota 210

IN MEMORIAM..... 213

REPORTS AND ANNOUNCEMENTS..... 214

OF GENERAL INTEREST..... 215

BOOK REVIEWS 220

Contents of MINNESOTA MEDICINE copyrighted by Minnesota State Medical Association, 1943

Entered at the Post Office in Minneapolis as second class mail matter. Accepted for mailing at the special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 13, 1918.

MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL ASSOCIATION

Published by the Association under the direction of its Editing and Publishing Committee

EDITING AND PUBLISHING COMMITTEE

E. M. HAMMES, Saint Paul
PHILIP F. DONOHUE, Saint Paul
H. W. MEYERDING, Rochester
H. A. ROUST, Montevideo
B. O. MORK, JR., Worthington
A. H. WELLS, Duluth
O. W. ROWE, Duluth
T. A. PEPPARD, Minneapolis
HENRY L. ULRICH, Minneapolis
C. L. OPPEGAARD, Crookston

EDITORIAL STAFF

CARL B. DRAKE, Saint Paul, Editor
GEORGE EARL, Saint Paul, Associate Editor
HENRY L. ULRICH, Minneapolis, Associate Editor

BUSINESS MANAGER

J. R. BRUCE

Annual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian Subscriptions—$3.50.

The right is reserved to reject material submitted for editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

Classified advertising—five cents a word; minimum charge, $1.00. Remittance should accompany order.

Display advertising rates on request.

Address all communications to Minnesota Medicine, 2642 University Avenue, Saint Paul, or National Bldg., Minneapolis. Telephone Nestor 2641.

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN



MAIN BUILDING—ONE OF THE 5 UNITS IN "COTTAGE PLAN"

A Modern Private Sanitarium for the Diagnosis, Care and Treatment of Nervous, Mental and Medical Cases

Located on beautiful Lake St. Croix, eighteen miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Milk, cream and butter from our own herd of Tuberculin-tested Registered Guernsey Cows. Inspection and coöperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

CONSULTING NEURO-PSYCHIATRISTS

RESIDENT PHYSICIAN
Howard J. Laney, M.D.
Prescott, Wisconsin
Tel. 39

Hewitt B. Hannah, M.D.
Joel C. Hultkrans, M.D.
511 Medical Arts Building
Minneapolis, Minnesota
Tel. MAin 4672

SUPERINTENDENT
Ella M. Mackie
Prescott, Wisconsin
Tel. 69



Some overworked doctor may appreciate knowing that . . .

Biolac saves time

Biolac provides for all nutritional needs of the young infant except vitamin C. You save valuable time because there are no extra formula ingredients to be calculated.

Biolac assures formula safety

Since mothers simply dilute Biolac with boiled water as you prescribe, there is less chance of upsets arising from errors or contamination in preparing formulas.

NO LACK IN BIOLAC

Borden's complete infant formula

• *Biolac is prepared from whole milk, skim milk, lactose, Vitamin B_1, concentrate of Vitamins A and D from cod liver oil, and ferric citrate. It is evaporated, homogenized, and* sterilized. *For professional information, write Borden's Prescription Products Division, 350 Madison Avenue, New York City.*

ACCEPTED AMERICAL MEDICAL ASSN

WHEN YOU SEND THEM

send





Camel

costlier tobaccos_

CIGARETTES —

*the Favorite**



YOUR friends, relatives, fighting in far-off places . . . grimly battling against death, infection . . . think what a smoke can mean to them . . . in comfort—in consolation . . .

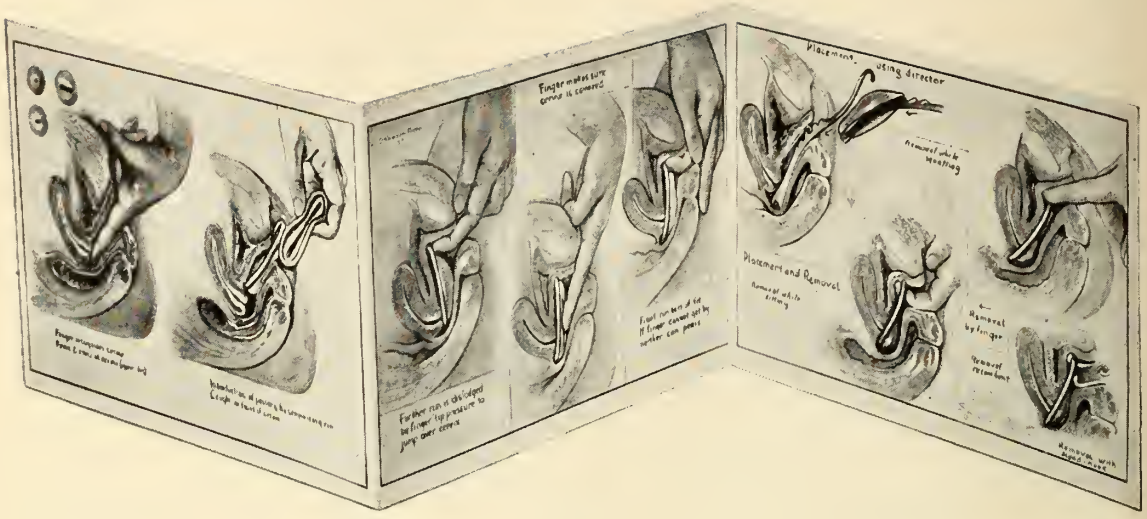
And remember, too, when you go to send that precious carton of cigarettes, that Camel, by actual survey*, is the favorite of men in the armed forces—for mellow mildness and appealing flavor.

Your dealer sells Camels by the carton; drop in and see him today.

* With men in the Army, the Navy, the Marine Corps, and the Coast Guard, the favorite cigarette is Camel. (Based on actual sales records in Post Exchanges and Canteens.)

—the favorite brand in the Armed Forces*

11th Edition Now Out *Send for Copy*



The Technique *of* Fitting Diaphragms

A series of charts in booklet form (6 x 9) clearly illustrating the technique of fitting diaphragms by the physician, now accompanied by the Dickinson-Freret Charts in two colors. For use by the physician in explaining the technique to his patient. These charts are regarded as the most helpful explanatory aid on the subject ever published. Eleventh edition now out. Write, or use coupon, for a copy.

Holland-Rantos
Company, Inc.
551 FIFTH AVENUE, NEW YORK, N. Y.

Holland-Rantos Co., Inc.
551 Fifth Avenue
New York, N. Y.

Without cost, please send your booklet on Fitting Technique to:

Dr.....

Street.....

City.....State.....



● A product of Ciba research introduced after years of extensive laboratory and clinical study.

PRIVINE* HYDROCHLORIDE

New Powerful Synthetic Vasoconstrictor

▶ ***PRIVINE-Hydrochloride*** acts quickly to clear nasal congestion due to Colds, Hay Fever, Rhinitis, Ethmoiditis, and Rhinosinusitis. Its markedly prolonged duration of effect is outstanding . . . in most cases the vasoconstriction lasts from 2 to 6 hours.

▶ Great care has been exercised in preparing ***PRIVINE-Hydrochloride*** solutions to meet all requirements for modern nasal medication[1]. The isotonic and buffered solution restores the normal pH of the nasal mucosa and maintains ciliary activity.

▶ ***PRIVINE-Hydrochloride*** (Brand of Naphazoline) applied either by drops or nasal spray is preferred by physician and patient due to its lack of local or systemic side effects. Available in 0.1% solution in 1 oz. bottles and also 0.05% in 1 oz. bottles for children. Literature and samples on request.

1. Fabricant, M. D.: "Nasal Medication," Williams and Wilkins Company, October, 1942.

*Trade Mark Reg U. S. Pat. Off.

CIBA Pharmaceutical Products, Inc.
SUMMIT, NEW JERSEY

WHO ARE THE MEN BEHIND THE "FACTS"

?

FACTS quoted by PHILIP MORRIS are based on studies conducted by recognized authorities whose work is known to the profession... whose findings have been published in leading medical journals.*

Their tests, not only in the laboratory, but in the clinic as well, have conclusively *proved* PHILIP MORRIS Cigarettes to be *definitely and measurably less irritating* to the sensitive tissues of the nose and throat . . . an advantage due to a difference in the *manufacture* of PHILIP MORRIS.

May we suggest that you try PHILIP MORRIS, and observe the results for yourself?



PHILIP MORRIS

PHILIP MORRIS & CO., LTD., INC.
119 FIFTH AVENUE, N. Y.

* *Laryngoscope, Feb. 1935, Vol. XLV, No. 2, 149-154*
Laryngoscope, Jan. 1937, Vol. XLVII, No. 1, 58-60
Proc. Soc. Exp. Biol. and Med., 1934, 32, 241
N. Y. State Journ. Med., Vol. 35, 6-1-35, No. 11, 590-592.

For timely and effective control of Scarlet Fever...

Treatment . . .

Scarlet Fever Streptococcus Antitoxin

GLOBULIN *Lederle* MODIFIED

Prevention . . .

Scarlet Fever Streptococcus Toxin

Lederle

TODAY ANTITOXIN THERAPY may be administered with comparative safety —for both mild and severe scarlet fever. The advanced process of serum refinement by Parfentjev of Lederle Research Laboratories has greatly reduced the incidence of serum sickness[1]. This Globulin-Modified antitoxin usually brings about a sharp drop in temperature and prompt disappearance of symptoms[2,3]. Early administration is advised to thwart the development of complications[4].

In infected, susceptible persons, "Scarlet Fever Streptococcus Antitoxin *Lederle*" may be injected for prophylaxis, and a passive immunity is produced, lasting about two weeks. However, this temporary measure must be followed one week later by active immunization for lasting protection.



Sterility Test

"Scarlet Fever Toxin *Lederle*," for active immunization, is a highly potent and carefully standardized preparation. Complete immunization can be achieved only if a full course of undivided doses is given. By such a method 90-95% of individuals may be rendered Dick-negative, the majority remaining so for as long as 12 years[4].

Some recommend that every child be given a Dick test on entrance to school or an institution, and that a record be kept of the result[5]. Dick-testing and immunization of susceptible individuals is indicated[6] in emergencies such as threat of an epidemic. It is a timely procedure for the large numbers of children who are being moved, in many parts of the country, into over-crowded war-plant areas.

[1]KOJIS, F. G.: Am. J. Dis. Child. 64.93 (July), 1942; 64.145 (Aug.) 1942.
[2]TOP, F. H., and YOUNG, D. C.: J.A.M.A. 117:2056 (Dec. 13) 1941.
[3]PALMER, L.: Kentucky M. J. 40:254 (July) 1942.
[4]MELNICK, T.: Arch. Pediat. 59:90 (Feb.) 1942.
[5]HOYNE, A. L.: Illinois M. J. 81:12 (Jan.) 1942.
[6]THOMPSON, C. G.: Connecticut M. J. 5:736 (Oct.) 1941.

PACKAGES:

Scarlet Fever Streptococcus Toxin *Lederle*
1 complete immunization: 5 vials of 650, 2,500, 10,000, 30,000 and 100,000-120,000 S. T. D.
10 complete immunizations: 5—10 cc. vials.
Dose No. 5 for supplementary immunization: 1—1 cc. vial containing 100,000-120,000 S. T. D.

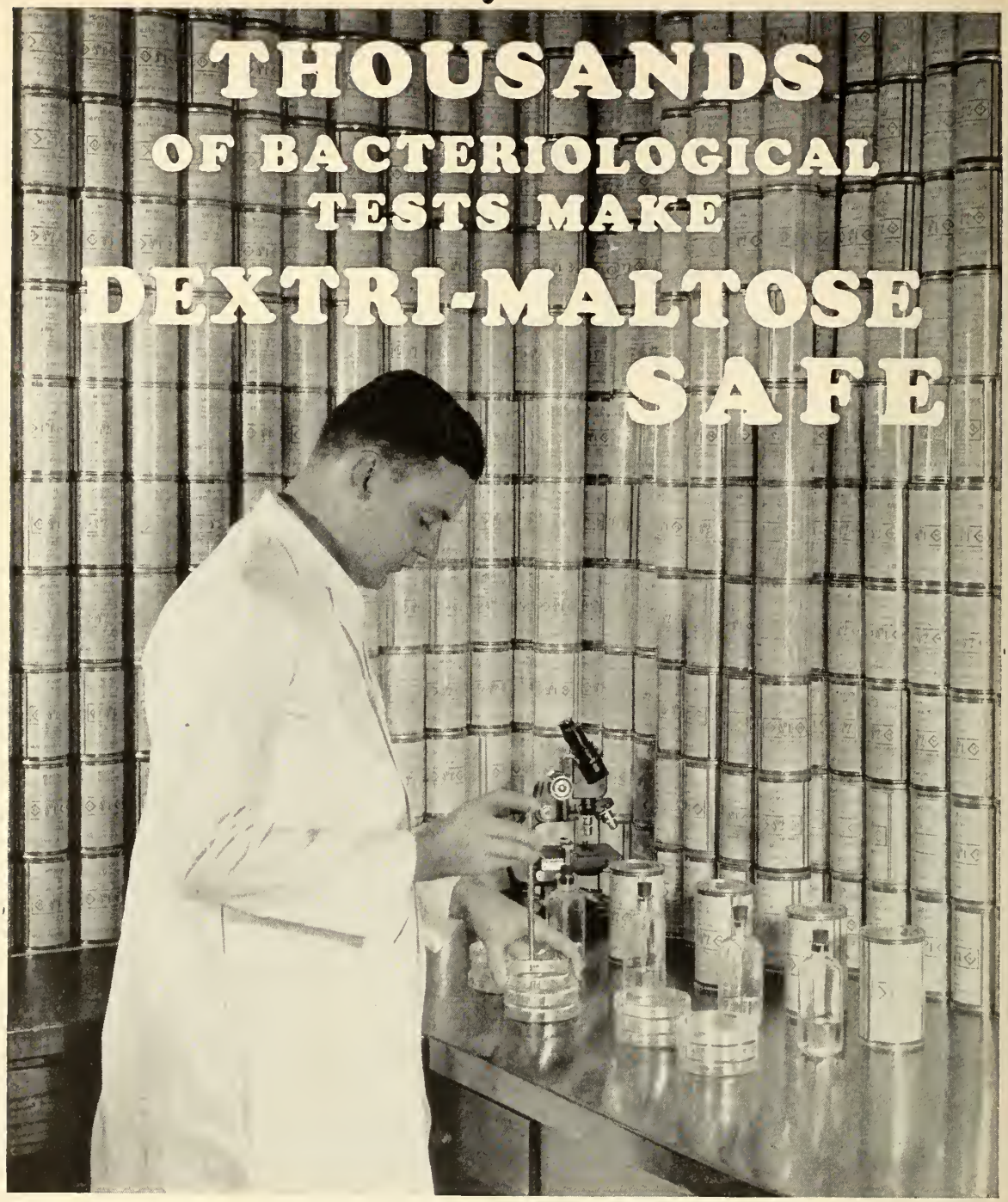
Scarlet Fever Streptococcus Antitoxin (Globulin Modified) *Lederle*
3,000 U. S. P. H. S. units (150,000 original neutralizing units) for prophylaxis and 9,000 U. S. P. H. S. units (450,000 original neutralizing units) for therapeutic use.

Scarlet Fever Streptococcus Toxin for Dick Test *Lederle*
5 Dick Tests in 1—2.0 cc. ampul.
50 Dick Tests in 1—10.0 cc. vial.

ACCEPTED AMERICAN MEDICAL ASSN Council on Pharmacy and Chemistry

LEDERLE LABORATORIES, INC., 30 Rockefeller Plaza, New York, N. Y.

THOUSANDS OF BACTERIOLOGICAL TESTS MAKE DEXTRI-MALTOSE SAFE

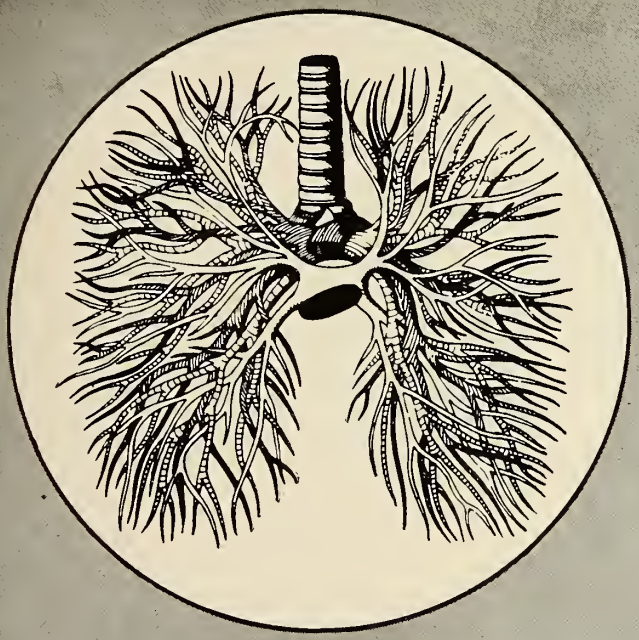


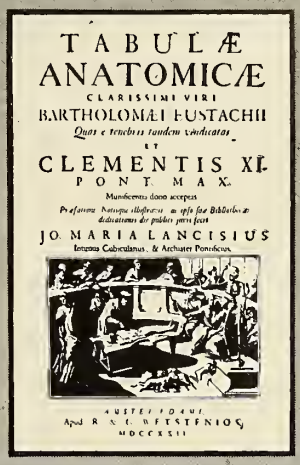
Skilled bacteriologists constantly test Dextri-Maltose

THOUSANDS of samples of Dextri-Maltose, secured both during the course of manufacture and after packing, are continually analyzed bacteriologically. This close correlation between laboratory and factory results in a product having a remarkably low bacterial count—well under 100 per gram. A quarter of a century of clinical success has demonstrated that such ceaseless vigilance is indispensable to safety. Here, where the life and health of the infant and the reputation of the physician are in the balance,—VALUE, NOT PRICE, IS THE TRUE MEASURE OF ECONOMY.

SANITARY CONTROL OF DEXTRI-MALTOSE . . . (NO. 2 OF A SERIES)

Please enclose professional card when requesting samples of Mead Johnson products to cooperate in preventing their reaching unauthorized persons
Mead Johnson & Company, Evansville, Ind., U. S. A.





● From the rare volume, "Tabulae Anatomicae" by Bartholomaei Eustachii, comes this interesting illustration of the bronchi, arteries and veins of the lungs. Published in 1722.

SOUNDING THE

ALL CLEAR

WITH ADRENALIN IN ASTHMA

Adrenalin* saunds a clear, unwavering nate in its marked ability to dilate and clear the bronchioles in bronchial asthma . . . Adrenalin in aqueaus salutians far speedy relief in asthmatic emergencies . . . Adrenalin in Oil far sustained all-night relaxatian and camfart. Na medication is more effective, nane mare widely relied upon.

Adrenalin, an epinephrine manufactured exclusively by Parke, Davis & Campany, is af value in preventing and treating various allergic states, in checking superficial hemorrhage, far stimulating vital centers in certain crises.

Adrenalin is a powerful vasocanstrictar, circulatary stimulant and hemostatic. It represents a standardized, natural harmane, 100 per cent active. Are yaur bag and affice supplied?

*Trade-mark Reg. U.S. Pat. Off.

Adrenolin Chloride Solution.....**1:1000**
Adrenolin Chloride Solution.....**1:100**
Adrenalin in Oil Ampoules.....**1:500**

Products of modern research offered to the medical professian by Parke, Davis & Company, Detroit, Michigan.

PARKE, DAVIS & COMPANY
DETROIT, MICHIGAN

PYOKTANIN SURGICAL GUT

Plain and Formalized

Manufactured Since 1899 by

The Laboratory of the Ramsey County Medical Society

Packaged dry in hermetically sealed glass tubes in accordance with the new requirements of the U. S. Pharmacopœia.

• • •

Price List

PLAIN TYPE A NONBOILABLE
AND
FORMALIZED TYPE C NONBOILABLE

Sizes.....000 — 00 — 0 — 1 — 2 — 3
28 inches.....per dozen strands $2.00
60 inches.....per dozen strands $3.00

Special discount to hospitals and to the trade. Cash must accompany the order.

• • •

Address

LABORATORY RAMSEY COUNTY MEDICAL SOCIETY

Lowry Medical Arts Building, St. Paul, Minnesota

FOR SALE BY SURGICAL DEALERS AND DRUGGISTS



To THE PATIENT who is ill or care-obsessed the administration of Ipral may mean the difference between long, dragging hours of wakefulness and a sound, restful sleep closely resembling the normal.

Used for more than fifteen years as a safe, effective sedative, Ipral, an intermediate acting barbiturate, produces a 6- to 8-hour sleep from which the patient awakens generally calm and refreshed. Dosage is small . . . absorption and elimination rapid . . . and cumulative effects avoidable by proper dosage regulation.

HOW SUPPLIED

Ipral Calcium (calcium ethylisopropylbarbiturate) in 2-grain tablets and in powder form for use as a sedative and hypnotic. ¾-grain tablets for mild sedative effect throughout the day.

Ipral Sodium (sodium ethylisopropylbarbiturate) in 4-grain tablets for pre-anesthetic medication.

Elixir Ipral Sodium in pint bottles.

For literature write Professional Service Dept., E. R. Squibb & Sons, 745 Fifth Ave., New York

E·R·SQUIBB & SONS

Manufacturing Chemists to the Medical Profession Since 1858



REST HOSPITAL

A quiet, ethical hospital with therapeutic facilities for the diagnosis, care and treatment of Nervous and Medical cases. Invites cooperation of all reputable physicians who may supervise the treatment of their patients.

PSYCHIATRISTS IN CHARGE
Dr. Hewitt B. Hannah
Dr. Joel C. Hultkrans

2527 2nd Ave. S., Minneapolis, Phone At. 7369

POKEGAMA SANATORIUM

operated by

H. LONGSTREET TAYLOR FOUNDATION

Reception Hospital



Thoroughly Equipped for the
Medical and Surgical Treatment of

TUBERCULOSIS

Artificial pneumothorax, oleothorax, phrenicectomy, thoracoplasty, pneumolysis, bronchoscopy, alpine lamp and heliotherapy. Operating, throat, dental and lamp rooms. Complete clinical and X-ray Laboratories.

Electric Blankets in All Beds

A reduction has been made in rates.

Railroad, Bus, Telegraph and Telephone Stations: Pine City, Minn. Descriptive circular sent on request.

F. F. CALLAHAN, M.D., Medical Director
POKEGAMA, PINE COUNTY, MINN.

CHILDREN ADMITTED

Chemotherapy
OF THE PNEUMONIAS

Sulfathiazole exerts a pronounced and rapid bacteriostatic effect upon the most common causative organisms of pneumonia (pneumococci, hemolytic streptococci, staphylococci). It is not necessary to delay treatment of pneumonia until the laboratory report on sputum typing has been received.

In the vast majority of cases Sulfathiazole is administered by mouth; occasionally it is necessary to resort to injection. Only in certain circumstances is specific serum also indicated.

Write for booklet on Sulfathiazole which includes also a discussion on the treatment of gonococcus and staphylococcus infections.

HOW SUPPLIED

Tablets of 0.5 Gm. (7.72 grains), bottles of 50, 100 and 500. Also *primarily for children* tablets of 0.25 Gm. (3.86 grains), bottles of 50, 100 and 500.

Powder in bottles of 5 Gm., ¼ lb. and 1 lb.

Specify

SULFATHIAZOLE

Winthrop



This cherished symbol of distinguished service to our Country woves from the Winthrop flogstaff.

Pharmaceuticals of merit for the physician



ENDURING CHARACTER



SIXTY-SEVEN YEARS—TIME TO TRAIN SUCCEEDING CROPS OF YOUNG MEN IN LILLY TRADITIONS—TIME TO ESTABLISH A SOLID FOUNDATION ON A POLICY THAT IS STRIKINGLY LIKE THE GOLDEN RULE.

ELI LILLY AND COMPANY

INDIANAPOLIS, INDIANA, U. S. A.

FOR THE PHYSICIAN'S PRESCRIPTION — Lilly

Buy War Bonds

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 February, 1943 No. 2

TUBERCULOSIS OF THE EYE

F. H. HAESSLER, M.D.
Milwaukee, Wisconsin

HOWEVER alluring the many theoretical problems are, for the practicing oculist, the central problems of tuberculosis are diagnosis and therapy. The two functions expected of a physician are that he give his patient reliable advice and, where possible, institute such measures as will beneficially influence the course of the disease. In tuberculosis it is of particular importance that the fundamental reactions be understood because an etiological diagnosis is of importance. It is on the basis of such diagnosis that *specific therapy* can be instituted.

The diagnosis of tuberculosis of an eye is never completely certain. It is always a diagnosis of probability, and it must be admitted that the prejudices of the individual diagnostician play a part in the decision. This makes it impossible to arrange reliable statistics as to the occurrence of tuberculosis of the eye. Some German clinics classify over one-half of their cases of uveitis as tuberculosis, while some American workers whose attention is centered on focal infections find no more than 5 per cent. The diagnosis is based on four kinds of data, namely:

1. An understanding of the reactions and the change of reaction in tissue in general produced by tuberculous infections.
2. The characteristics of eye lesions which previous clinical and pathological experiences have shown to be tuberculous.
3. Evidence that the patient has been infected with tuberculosis as is shown by reactions to the injections of tuberculin and by the presence of tuberculosis in other organs.
4. The inability to demonstrate another etiology.

When tubercle bacilli first invade a body, they cause an inflammatory reaction or tubercle formation at the site of invasion and are also disseminated to the regional lymph-nodes. In most cases the portal of entry is the lung, and the primary complex involves pulmonary tissue and the tracheobronchial lymph-nodes. Other organs may also be the seat of primary infection: for example, the intestine or the conjunctiva. The latter is rare but is occasionally seen as a unilateral ulcerated conjunctival nodule with swelling of the preauricular lymph-node almost always in young patients. The primary reaction is probably stimulated by the lipoid fraction of the tubercle bacillus body. Wherever introduced into a hitherto uninfected body, the tissue reacts either with inflammation or tubercle formation. It is the relative number of bacilli and the site of their lodgment that determines which of these reactions takes place.

From this primary complex, tubercle bacilli may be transferred to other parts of the body. In most instances the secondary infection is spread by way of the blood. This is true even of the choroidal lesions accompanying tuberculous meningitis. Much more rarely is the infection spread by the lymphatics or by direct extension from contiguous structures. The nature of the secondary lesion depends not only on the site

Presented before the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 1, 1942.

of the metastatic lesion but on the reaction of this tissue. The reaction of the secondarily invaded tissues differs from that at the site of the primary complex because the changes take place in the tissues of the host in the weeks that follow primary invasion by tubercle bacilli. The tissues become hypersensitive or allergic and an immunity develops which is a mechanism consisting of several factors not completely understood which bring about increased resistance to the bacillus.

The allergy is a characteristic reaction of the human body to all foreign protein of whatever nature. As a result of primary infection, the tissues of the host become allergic to the tubercle bacillus protein. This tuberculo-protein or antigen combines with the allergic antibody which is produced in the tissue cells—not the body fluids—to form a necrotizing poison. Everything that happens at the site of an uncomplicated allergic reaction is merely the standard reaction of the body to a chemical irritant. With properly adjusted concentrations, it would be possible to produce with sulphuric acid a lesion indistinguishable histologically from antigen antibody inflammations. It causes cellular damage and may seriously impair healing. It is also largely responsible for the inflammatory reaction which is largely a vascular reaction. Allergy does not, however, induce tubercle formation. That is a response to the lipoid of the bacillus. Tubercle formation requires no inflammatory paralysis of vascular walls for its evolution. It is the most primitive organized reaction to an invading organism and can occur in animals that have no vascular system. Tubercles can form independently of blood vessels in any tissue to which mononuclear phagocytes have access—even in vitro in tissue cultures.

The other change produced by primary invasion of the host is immunity. That is a complex reaction which consists of a number of factors which tend to fix the bacilli near the site of invasion, to limit their spread, and to inhibit their growth so that repair may take place in the tissue of the host. The repair may result in complete destruction of the invader, and restitution of the invaved tissue to its normal state or more often an encapsulation of an infected area by a thick fibrous coating which protects surrounding tissues from invasion.

The two mechanisms, allergy and immunity, are separate entities, and allergy plays no part in immunity. It is doubtful that allergy even helps fix the bacilli at the site of invasion. This is accomplished by a specific precipitin-like mechanism which is part of the immunity reaction. When allergic inflammation occurs about a quiescent focus, there is a marked tendency to spread rather than to immobilization. The allergic reaction may also destroy newly-formed granulation tissue and so hinder rather than help the healing process.

Allergy seems unrelated to immunity. It can easily be produced as a response to the injection of dead tubercle bacilli or tubercle bacillus protein alone while immunity develops only as a response to the introduction of living tubercle bacilli. In the course of time the allergy wanes, and after the lapse of months following the injection of antigen, disappears. Despite the absence of allergy, however, such animals are found to be highly immune. In animal experiments, the criteria of allergy are reactions to injections of antigen: immunity is judged by survival time of the animal.

Allergy and immunity are the two important factors which determine the nature of all secondary or metastatic tuberculous lesions. Each may vary in quantity. A high degree of allergy or hypersensitivity makes a lesion highly inflamed and exudative, breaks down new-formed granulation tissue and hinders healing. Immunity inhibits the growth of tubercle bacilli, and prevents their spread, and allows reparative processes to proceed.

A host with high allergy and low immunity has the most malignant form of progressive inflammatory destructive and exudative tuberculosis. It is the type most dangerous to treat with tuberculin. On the other hand, low allergy and high immunity produces benign, torpid, productive fibrotic lesions with a tendency to heal. All possible quantitative combinations of these two factors may occur and produce the innumerable clinical manifestations of tuberculosis. There are, of course, other factors, some probably unknown and others well known, such as the number and virulence of the infecting bacilli.

In the young, when metastases occur soon after primary infection and before the host has become highly allergic, one often finds discrete tubercles with little inflammatory reaction. The less marked the inflammatory aspect of the le-

sion, the better the prognosis. In somewhat older patients who have become highly allergic, the lesions are characterized by severe inflammation and copious plastic exudation. The whole posterior surface of the cornea may become covered with mutton-fat deposits. The tuberculosis, usually uveitis, which begins later in life, say after forty, is usually free from marked congestion. The patients come for slowly progressive failing of vision, not redness or pain in the eye and strikingly the great majority are women.

Type of Lesion

Any structure of the eye may become the seat of a tuberculous lesion, but in the overwhelming majority of cases it is the uvea. This preponderance is so great that all other tuberculous lesions of the eye seem rareties. Tuberculosis has a special prediliction for vascular and connective tissue, hence the uvea is the tissue first involved. From here it may spread to other tissues of the eye.

The conjunctiva may be the seat of a primary form of exogenous infection. This is a unilateral ulcerous nodule accompanied by swelling of the preauricular gland.

Secondary conjunctival tuberculosis may take the form of a proliferative lesion of granulation tissue which may ulcerate or not, and occasionally becomes manifest as a tumor-like tuberculoma. In contrast to other forms of episcleritis, such tubercles are indolent. They do not ulcerate, and if they heal at all, do so without loss of substance. Differentiation from other nodular lesions such as aphthalmia nodosa, vernal catarrh, and others is not always possible and biopsy is advisable.

The corneal lesions are probably always extensions from a metastatic uveal lesion. Sometimes extension is direct and sometimes by rupture of a tubercle into the anterior chamber or Schlemm's canal. The clinical picture is not pathognomic. Suggestive is the marginal distribution and anterior position of the infiltrated areas. They tend to heal and to recur. A deep central infiltrate is sometimes observed and is believed to result from aqueous infection. Direct extension from the sclera produces sclerosing keratitis.

Deep scleritis is characteristically tuberculous. It is extremely resistant to treatment, protracted in course, and is apt to recur. The weakened sclera may bulge. Histological preparations are characterized by typical tubercle formations.

Uveal tuberculosis is so much the most common manifestation of the disease that ocular tuberculosis means uveitis to many. When actual tubercles are visible or the equally characteristic evanescent semi-transparent Koeppe nodules on the pupillary margin, the diagnosis does not present much difficulty. When the iritis is diffuse, an etiological diagnosis is less obvious, often difficult and frequently impossible. When the exudate is serous and is characterized by cells or cell clumps in the aqueous and well-formed cell masses floating in the convection current in the aqueous or deposited on the post corneal surface, most characteristically in the lower quadrant, a diagnosis of tuberculosis, syphilis, or sympathetic ophthalmia suggests itself. Absence of preceding trauma and a negative Wassermann reaction make tuberculosis a likely diagnosis. When the exudate is fibrinous, the aqueous is also characterized by freely floating cells, but they soon become entangled in a fibrinous network and all orderly movements stop. Efflorescences on the pupillary margin are never seen in this type. The stroma becomes swollen, hyperemic, and hemorrhagic and eventually hypopyon and hyphema develop. This is the picture associated with acute iritis whose etiology seems most often to be focal infection or gonorrhea.

Unfortunately these clinical pictures are only suggestive of certain etiological factors and by no means pathognomic. It must be emphasized that the eye may respond to the stimuli produced by tuberculous infection in a multitude of ways and even the most stormy course does not rule out tuberculosis.

Before the observation of von Michel it was thought that only those ocular inflammations associated with visible nodules could be called tuberculous. He recognized the fact that an iris which was clinically free from nodules might still show typical miliary tubercles histologically. In this country Verhoeff reported a case of iritis whose chief characteristic was acute fibrinous exudate without any nodules. Tuberculosis was not even suspected until typical tubercles were seen in the histological preparations made from the eye after it was enucleated for pain. He has collected several similar instances and other observers have corroborated these findings.

Similar observations can be made in the choroid. The nodular lesion immediately sug-

gests a tuberculous etiology, while in the case of diffuse and exudative lesions, this etiology is less readily suspected.

In the retina the characteristic tuberculous lesion is the syndrome known as recurrent juvenile vitreous hemorrhage. If the hemorrhage is small so that the fundus is visible, one frequently sees localized opacities associated with the retinal veins which are the clinical expression of tubercles in the venous wall. This has until recently been considered a disease sui generis. It has been rather generally believed to be a manifestation of tuberculosis although even this has been doubted by Marchesani who believes many cases of retinal perphlebitis to be part of generalized endarteritis. The recent work of Meyer, however, based on histological study of an unusually large number of eyes makes it clear that the disease is in most instances tuberculous. Furthermore, he demonstrated that it is not usually an isolated disease but in the majority of cases an extension of an uveitis which had not been clinically manifest. Most often the uveitis precedes the perphlebitis but the opposite may be true. There is no essential difference between the isolated perphlebitis and one consecutive to iridocyclitis. Clinically the only difference is that the former is more often associated with hemorrhage. Ophthalmoscopically the pictures are identical when not obscured by hemorrhage.

The substratum of the clinical mantle about the veins is an infiltration of the perivascular lymph sheath with lymphocytes. The infiltration consists for the most part of round cells only very occasionally of specifically tuberculous granulation tissue. The process is often accompanied by proliferation of the cells of the vascular wall so that the lumen is obliterated, which is followed by the formation of new vessels which become clinically visible. Many transitions are found between these infiltrates and tubercle in the nervous tissue.

The tuberculosis is partly transmitted from the anterior uvea by means of the lymphatic circulation in the perivascular lymph sheaths which surround the blood vessels of the retina which have no other lymphatics. Infection has also been observed to arise by direct perforation of a choroidal tubercle which may be followed by numerous superficial tubercles on the inner surface of the retina from dissemination on the vitreous. Direct hematogenous infection of the retina is also possible.

Relation of Ocular Tuberculosis to Tuberculosis Elsewhere

Since ocular tuberculosis is a secondary infection, there are two points on which a general examination can give diagnostic aid. It can sometimes find the seat of the primary lesion and even uncover evidence that it is active in giving off bacilli. When this is not possible, a positive intradermal tuberculin reaction can at least demonstrate that the patient has in his body living or recently dead tubercle bacilli that are responsible for his sensitivity to tuberculo-protein. In absence of this, an etiological diagnosis of tuberculosis has little support.

The consensus of opinion among ocular tuberculographers is that it is probable that the primary lesion for most ocular tuberculosis is intrathoracic, specifically hilus gland tuberculosis. Physical examination and refined roentgenograms give very reliable information about these lesions. Since the bacilli are frequently disseminated from a lymph-node breaking through into a vein, they must pass through the pulmonary circulation before they again have access to the general circulation. One would expect to find metastatic lesions in the lung as well as in the eye in at least some of the patients. This has indeed been found to be true. Werdenberg has demonstrated roentgenograms which give evidence of miliary tubercles in the eye corresponding in age with the ocular lesion. In a study of 500 patients, Werdenberg found that roughly 60 per cent had mild intrathoracic tuberculosis associated with severe ocular tuberculosis; in 30 per cent the two lesions were equally seen, and in 10 per cent there was an inverse relationship; namely, the pulmonary disease was severe and the ocular lesion mild.

These findings must not be believed to be in disharmony with the statement based on experiences of many tuberculographers with thousands of patients, namely, that ocular metastasis is the greatest rarety in patients with severe progressive pulmonary disease. This progressive pulmonary disease is probably the result of exogenous reinfection. Patients whose immunity is kept at a high level by the escape into his bloodstream of a small number of bacilli from a lymph-node from time to time is able to cope

with the reinfection. The patient with ocular metastasis is in this position.

The tuberculin reaction is a test of allergy or hypersensitivity. Since allergy wanes in the course of months unless it is kept at its level by the introduction of new tuberculo-protein from bacilli in a lymph-node or other site of inflammation, a positive reaction is good evidence that the patient harbors tubercle bacilli. This tuberculosis may be inactive in an encapsulated lesion which is not a source of metastasis. If the test is negative it may mean that the patient has never been infected with tuberculosis, or long enough before the test so that allergy has waned, or so recently that allergy has not yet developed. This takes several weeks (four to eight) to occur. The test may also become negative in moribundi, febrile patients and after therapy with tuberculin.

In performing the tuberculin test, Koch's old tuberculin (O.T.) in dilution is commonly injected intradermally so that 1/1000 milligram O.T. is introduced into the skin. If this fails to cause hyperemia and edema, 1/100 milligram is injected and finally 1/10. One-tenth cubic centimeter of dilution, 1/100,000, 1/10,000, and 1/1000 respectively contain this amount of O.T. more recently the American Tuberculosis Association has been recommending a product known as p.p.d. These letters are the initial letters of "purified protein derivative." It represents the protein extracted from cultures of strains of tubercle bacilli whose virulence and behavior are well known and purified by means of a standardized chemical procedure. Its great advantage is absolute uniformity of the re-agent and, therefore, the production of comparable results for statistical analysis. The product is dispensed in tablets in which p.p.d. is incorporated in sterile lactose tablets in quantities of 0.0002 milligrams and 0.05 milligrams. The smallest dose detects a high percentage of total positive reactions with a minimum of severe reactions. The larger dose is designed for repeat tests on those whose reaction was negative with the smaller dose. The first dose is equivalent to one or two 1/1000 milligrams O.T., the second to 1 milligram O.T. The skin reaction has been classified:

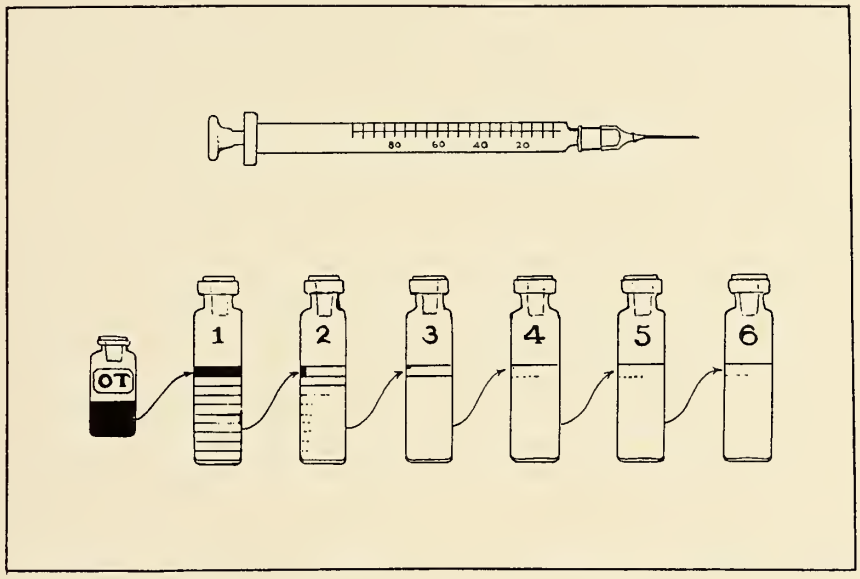


Diagram showing the entire equipment needed for therapy with tuberculin. One-tenth c.c. O.T. is taken from the purchased vial with a tuberculin syringe without removing its rubber stopper. This 1/10 c.c. O.T. is injected into another vial, through its rubber stopper containing 9/10 c.c. physiological salt solution. One-tenth c.c. of dilution No. 1 is injected into the next vial of the series to make dilution No. 2 (1/100 O.T.). The process is repeated serially.

+	some redness and edema between 5 and 10 millimeters in diameter
++	redness and edema between 10 and 20 millimeters in diameter
+++	redness and edema greater than 20 millimeters in diameter
+++++	marked redness and edema and some necrosis.

When testing a patient who has an eye lesion that suggests high allergy or is in so vulnerable a tissue as the retina, it is wise to be more cautious in using the diagnostic tests and injecting only 1/100 cubic centimeter of the 1/100,000 dilution O.T. or the smaller dose of p.p.d. or even less than this. If negative, the test can be repeated with a larger dose.

Both the finding of the intrathoracic lesion of active tuberculosis and a positive tuberculin reaction do not prove that the eye lesion in question is tuberculous. They make such a diagnosis possible. When the eye lesion has characteristics which suggest tuberculosis, the diagnosis is still more probable.

A fourth point in the etiological diagnosis is the exclusion of other possible etiological factors if all factors other than tuberculosis can be excluded, the diagnosis becomes still more probable. It can only be made certain after the eye has been enucleated.

Among lesions which may most nearly simulate tuberculosis are syphilis and sympathetic ophthalmia. The latter need not be considered in the absence of antecedant trauma. A negative Wassermann excludes syphilis except in cases of interstitial keratitis and here other stigmata of congenital syphilis are diagnostic.

Non-tuberculous foci of infection form a large group of possible primary lesions. It is as difficult to establish their participation in the geneses of a secondary ocular infection as that of tuberculosis itself.

The most likely seat of a nontuberculous infection which may involve the eye is the prostate gland. Teeth and tonsils and other organs may also be suspected and if disease is found in them, proper treatment should be applied.

Treatment

The treatment of patients with tuberculosis of the eye should be managed with the coöperation of an internist. The patient is ill with tuberculosis, and the fact that the seat of the inflammation is the eye and not the lung makes it no less important to apply such general measures as diet, rest, heliotherapy, and other forms of stimulaton as will increase his resistance to tuberculosis Indeed, some patients with ocular tuberculosis do not improve until these general measures are applied. Others get well with no other treatment than just such general measures. E. V. L. Brown reported his experience with four such patients. Many of the patients with ocular tuberculosis do indeed have an intrathoracic lesion as well which makes the internist's advice essential.

Such general measures as are used in the treatment of any other inflammatory disease of the eye are also indicated in tuberculosis—hot compresses, atropin, and nonspecific protein therapy. When all else fails, gold salts and roentgenotherapy are advised.

Most important to discuss, however, is the question of specific therapy with tuberculin. If one does not believe in its efficacy, there is hardly a logical reason for differentiating tuberculosis from the many other etiological factors which cause inflammation in the eye.

It must be emphasized that tuberculin can be harmful and extremely dangerous if it is improperly used. To use tuberculin intelligently, one must bear in mind its mode of action and the rationale of its application.

Tuberculin therapy may be used on the basis of one or both of two hypotheses.

1. It may desensitize the individual.
2. It may increase his local immunity about the focus of tuberculosis in the eye.

The process of desensitization is brought about by repeated injections of small doses of tuberculin, so small that one never produces a local or general reaction of any kind. The purpose of this mode of application is to reduce the patient's allergy to tuberculo-protein. In highly allergic patients, the reaction between antigen liberated at the site of the lesion and the antibodies produced by the defensive mechanism produces a necrotizing agent which destroys the newformed granulation tissue in the lesion and thus prevents its healing.

As long as one succeeds in administering doses that are sufficiently small, it is not harmful. Of course, it is possible because of error in judgment to give a dose that is too large for the patient at the time and do harm.

When treating on the hypothesis that tuberculin therapy increases immunity, one also gives repeated doses but strives for at least a local reaction. I doubt that anyone still advocates doses that produce a focal reaction. A focal

reaction would be highly dangerous in proliferative lesions and certainly destructive in exudative lesions in highly allergic eyes.

It is probable that the desensitization program is the more effective. In the practical routine of tuberculin therapy, the oculist guides himself by the appearance of the eye as therapy progresses, but he must never forget that the patient may have other tuberculous lesions—in particular intrathoracic lesions—and that he must have the coöperation of an internist to watch the other organs.

Choice of Tuberculin

It possibly makes little difference which form of tuberculin is used, although many experienced workers have decided preferences. If desensitization to tuberculo-protein is the basis of therapy, it certainly can make no difference, and p.p.d. would be the product of choice because of its chemical uniformity. However, since we are still inadequately informed, we cannot arbitrarily disregard personal opinion and belief based on clinical experience. Although we intend by our injection to desensitize the allergic patient, we may at the same time be increasing immunity factors when we use such whole products as Bacillary Emulsion (B.E.). This is not true of p.p.d. Theoretically, the only objection to B. E. is that we may because of inadequate division of particulate matter inadvertently introduce a much larger dose of protein with an occasional injection. This could not be true of O.T.

The factor of real importance, however, is the dose. One should start with extremely small quantities. It is convenient to make a series of dilutions, 1/10, 1/100, and 1/1000 and so on and number them to correspond to the number of zeros in the denominator than as dilution 1, 2, 3, and so on. Injections are best made intradermally.

It is wise to start with 0.01 cubic centimeter of dilution 6, never stronger than 5. In retinal lesions or in exudative lesions of the anterior chamber, or any lesion which we believe to be dangerous because of its location or the allergic state of the eye, we use No. 6.

We inject twice weekly and make each dose twice as large as the preceding one. As the doses get larger, the intervals may be increased to as much as one week. If we have reason to suspect that the lesion is a dangerous one, the dose may be increased by only one-half the preceding dose. It is dangerous, however, to schematize. One must carefully watch the eye for the slightest sign of reaction. In all cases of doubt, it is wise to give a smaller rather than the larger dose and to increase slowly.

References

In treating a subject briefly, there is always great danger that one presents data and their interpretation too schematically. The following references are given so that more extensive reading will dispel any false notions to which my condensation may give rise.

Adler, Francis Heed, and Meyer, George B.: Tuberculous lesions of the uveal tract. Arch. Ophth., 18:275, (Aug.) 1937.

Meyer, F. W.: Die Histologie der menschlichen und experimentellen Augentuberkulose mit besonderen Berucksichtigen der Netzhauterkrunkungen. V. Graefe's Arch., 141:495, 1940.

Meyers, J. Arthur: Tuberculosis among children and young adults.

Rich, A. R.: Role of allergy in tuberculosis. Arch. Int. Med., 43:691, 1929.

Werdenberg, Ed.: Theorie und Praxis der Augentuberkulose im Hochgebirge. Klin. Monatsbl. f. Augenh., 75:545, 1925.

Woods, Alan C.: The problem of ocular tuberculosis. Am. Jour. Ophth., 21:366, 1938.

MODERN METHODS OF CONTROL FOR MEASLES, SCARLET FEVER, AND DIPHTHERIA

ARCHIBALD L. HOYNE, M.D.
Professor of Pediatrics, University of Illinois College of Medicine
Chicago, Illinois

Measles

OF ALL the diseases known to mankind there is none more likely to occur in a lifetime than measles. This very fact is evidence of our inability to control the infection. From antiquity to the present day there seems to have been little change in the widespread distribution of measles and the universal susceptibility for all races without regard to climate, habits or social status. Age only is a restraining factor for we know that measles seldom occurs during the first three months

Presented before the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 29, 1942.

of life. But advancing years exert no check on susceptibility. Panum's vivid account of what happened in the Faroe Islands in 1846 is a good illustration that grandparents and grandchildren may share alike in respect to this disease. There it may be recalled that 6,000 of the 8,000 inhabitants were attacked by measles.

Epidemics of measles come with increases in population. When the supply of susceptibles has been exhausted there must be a pause until more children are born and others have advanced to the age of distinction when they may have measles. London has had an epidemic of measles every two years since 1856 until fateful 1940, when the bombing of the city seemed to have blasted the infection from the atmosphere. For although an epidemic was due none developed. In Chicago we had our greatest epidemic in 1938 when there were 37,831 cases. The next outbreak came last year, so there have been in 1942 only a few sporadic cases during March and April, months when the disease is at its peak in years of prevalence.

Because adults are not immune to measles unless they have experienced an attack, this infection is often of major importance in time of war. Among American troops from 1917 to 1919 there were 98,000 cases of measles. But it was not the office boys, not the city dwellers who suffered; it was the strong, husky youths from the small towns and country districts who had never had measles because they escaped exposure when children.

Measles is generally regarded as a virus disease, although some years ago Tunnicliff reported a green producing diplococcus as the causative factor. Virus diseases are usually more difficult to control than bacterial diseases because of the problems concerned in developing protective vaccines. Moreover, measles is a respiratory disease; it may not only be transmitted before the eruption but it is more contagious in the catarrhal stage than at any other time, and it is one of the most contagious of all diseases. On the other hand, the contagion of measles is not tenacious and it is short-lived. So the chances of measles being conveyed to a susceptible is far greater before the eruption has appeared than afterward. Some believe that by the time the eruption is fully developed the danger of contagion has practically ended.

The foregoing comments are presented for the purpose of emphasizing the perplexities that accompany any efforts to control measles. But this does not mean that no attempts should be made to prevent measles nor that successful procedures do not exist to accomplish that aim within certain limitations.

Immunization.—There is no artificial method for establishing a permanent protection from measles. And until some means is developed for active immunization satisfactory control of the disease cannot be accomplished. Rake and Shaffer have reported a new measles vaccine but little is yet known concerning its value. Temporary protection from measles is possible by the intramuscular injection of convalescent measles serum. Usually 7.5 c.c. of convalescent serum when given within three days of exposure will prevent the disease. The immunity, however, is not likely to endure for more than two or three weeks. Therefore, if a second exposure occurs two weeks or more after the administration of serum, a second injection will be required for further protection. Because human serum is used there should be no fear of reaction. If human convalescent serum is not available, whole blood from a parent who has a reliable history of having had measles may be substituted. But under the latter condition the quantity injected must be much greater, generally at least 30 c.c. being required.

Placental extract is also used for passive immunity and has the advantage of being easily available, as a rule. When the purpose is to prevent the disease some advise that 2 c.c. of this placental extract be injected intramuscularly at time of exposure and that 2 c.c. more be given about one week later.

Modification.—If any one of the measures just described is instituted more than three days after exposure, the susceptible person will probably develop measles in an attenuated form. Sometimes this result is preferable to prevention because a modified attack of measles leads to permanent immunity as a rule; whereas, absolute prevention is only a temporary state of immunity.

In an epidemic year or at any time that measles is known to be present in a community, chil-

dren with colds, no matter how slight, should be excluded from school and kept at home. Children who have had measles and live on the premises when an active case of the disease exists are allowed to attend school for two reasons: (1) it is assumed that second attacks of measles do not occur and (2) the infection is not carried by a contact for any considerable distance.

Placarding the premises where a case of measles exists is of no practical value in controlling an epidemic.

Scarlet Fever

Although scarlet fever is more subject to control than measles, it continues to be a major public health problem. Epidemics do not occur in any fixed cycles of regularity but the level of incidence remains on a relatively high plane with only slight recessions from year to year in ordinary times. During the epidemic of influenza in 1918, scarlet fever was at a low ebb in Chicago. However, the disease was unusually prevalent in 1916–17. In the present year, scarlet fever has continued the downward trend that became evident in 1941. It is interesting to note in this connection the experience of London in 1939 and 1940. Notwithstanding the exodus of hundreds of thousands of children from the cities in the fall of the former year to escape possible bombings and the return of more than 80 per cent by the close of the same year, there were fewer contagious diseases in London during 1940 than in 1939. No explanation is offered for this occurrence.

Efforts have been made to control scarlet fever by means of hospitalization. In small communities this plan should afford a fair degree of success but in larger cities it is a failure. Likewise quarantine measures applied to homes have often been unsatisfactory for the purpose of control. The explanation for this situation is not difficult. Among the scarlet fever patients entering contagious disease hospitals comparatively few give a history of contact with a known case of scarlet fever. How do they acquire the infection? Our answer must be that patients with tonsilitis or acute pharyngitis are not isolated, nor are those with streptococcic sore throats. Yet these conditions are all contagious and may be due to organisms capable of producing scarlet fever. Moreover, there are arbitrary periods established for quarantining scarlet fever patients. If the time is three weeks we regard the patient as contagious on the twentieth day of the disease but not on the twenty-first. This means that about 60 per cent of scarlet fever patients are turned loose on the public as scarlet fever carriers. Of course, the ideal procedure would be to require negative cultures for hemolytic streptococci from the nose and throat before isolation is terminated. But in large cities such a plan is not feasible.

Active immunization against scarlet fever by artificial means is the accomplishment most desired. Whether this ideal can now be achieved must depend upon one's conception of this disease. There is no doubt that a positive Dick test can nearly always be changed to negative by injections of scarlet fever toxin according to the Dick method. Nevertheless, the Dick negative individual is not immune to infection by hemolytic streptococci from a scarlet fever patient. But should this occur no rash is likely to appear on the skin even though the throat presents the characteristics of scarlet fever. Moreover, fever and adenopathy may be accompanying symptoms. Under such circumstances a diagnosis of scarlet fever is not likely. But if scarlet fever can occur without a rash, as is generally admitted, how are we to know that the condition is not scarlet fever? Possibly injections of scarlet fever toxin immunize only against the toxemia of scarlet fever, including the rash. Even if we grant only that, the procedure seems advisable. Moreover, if the five regular subcutaneous doses are feared because of possible reactions, the toxin may be administered in three intracutaneous doses of 0.1 c.c. each. The amount to be injected may be determined as follows: 1st dose, 0.2 of third regular dose; 2nd, 0.15 of fourth regular dose; and 3rd, 0.1 of fifth regular dose—all given at weekly intervals.

For passive immunization, convalescent scarlet fever serum in 10 c.c. doses, injected intramuscularly, gives very satisfactory results if used immediately after exposure. Its protective value is not likely to last for more than 10 days to two weeks. Therefore, if there is a second or continuous contact with a scarlet fever patient, it is well to repeat the dose after ten days. Since a human serum is used, unpleasant reactions need not be feared.

Should the convalescent serum be administered several days after exposure, it is likely to modify the attack of scarlet fever even if it does not prevent it. If convalescent scarlet fever serum is not available, whole blood—preferably from one who is Dick negative—in quantities of 20 c.c. to 30 c.c. may be substituted. Or a prophylactic dose of scarlet fever antitoxin can be used instead.

For many years it has been my opinion that if tonsils and adenoids were removed before children entered school there would be far less scarlet fever. Such a procedure might not lessen susceptibility but it would undoubtedly reduce the opportunities for infection from carriers.

Diphtheria

Diphtheria is more easily subject to control than any other disease with the exception of smallpox. Today it is hard to realize the excessive mortality in the past which prevailed for this infection. Morbidity rates are still too high in many of our states, though great improvement has taken place particularly in the East. In 1921 there were 2,165 admissions for diphtheria at Chicago Municipal Contagious Disease Hospital. Following an intensive immunization campaign only 96 diphtheria patients entered the same institution in 1933.

Local circumstances may possibly influence slightly the time selected for active immunization. Usually nine months is a good age for the undertaking. It is just as well to omit the Schick test and assume that the child is susceptible. For the purpose of conferring immunity we have had toxin-antitoxin, plain toxoid and alum precipitate toxoid. Now the first named is seldom used. Plain toxoid is best given in three doses of 1 c.c. each, three weeks apart. Sometimes 0.5 c.c. is given for the first dose. Injections are made subcutaneously. If alum precipitated toxoid is used instead of plain toxoid, at least two doses of 1 c.c. each should be administered about one month apart.

In recent years there has been an increasing tendency to immunize against more than one disease at the same time and with mixed antigens. This reduces the number of injections required. Ramon in France adopted this plan for diphtheria and tetanus. Combined diphtheria alum precipitated toxoid and tetanus alum precipitated toxoid are now obtainable. The dose is less than originally recommended. Each injection consists of 1 c.c. which is made up of equal parts of the two toxoids. Three doses are administered at from three to four week intervals. When these combined toxoids are administered there is a synergistic action; that is, the antibody response is greater to each toxoid when they are given together than to either one when injected separately. Moreover, unpleasant reactions are said to be no more common when using these combined toxoids than when diphtheria toxoid is given alone. This combined method of immunization is exceptionally valuable and should receive wider attention. If adopted it will often result in lessening anxiety and saving worry about the necessity for giving antitetanic serum. Should an injury occur where the possibility of tetanus must be considered, the administration of 1 c.c. of tetanus toxoid would probably result in approximately seven times as much protection as would be acquired by the injection of 1500 units of antitetanic horse serum, yet no horse serum sensitization would occur.

Still more recently a combination of diphtheria toxoid and pertussis vaccine has been recommended. Sauer advises this be given at seven months of age in three doses of 2 c.c., 2 c.c., and 3 c.c. at three-week intervals. While no synergistic action is claimed for this mixed dose, the results are said to be as good as if immunizations for the two diseases were done separately. The advantage is in the smaller number of injections required.

TUBERCULOSIS—A DISEASE OF OLDER, OCCUPIED MEN

So much emphasis has been placed on tuberculosis as a serious disease of girls and young women that its greater havoc among men has not received the attention that it deserves. As a result of the more rapid decline of tuberculosis in females in this country there are today 132 deaths among males to every 100 deaths in females, and only at ages ten to thirty is the mortality higher in females.—*The Modern Attack on Tuberculosis* by Henry D. Chadwick, M.D. and Alton S. Pope, M.D.

THE TOXEMIAS OF PREGNANCY

JOHN A. HAUGEN, M.D.
Minneapolis, Minnesota

INCLUDED among the toxemias of pregnancy are diseases peculiar to pregnancy and diseases that occur in the nonpregnant as well.

The symptoms, hypertension, albuminuria, and edema represent a syndrome in pregnancy which may be caused by more than one underlying pathological state. In this consideration of the subject, only pregnancy complicated by this symptom complex will be considered. Consequently, hyperemesis gravidarum, acute yellow atrophy of the liver and the many odd pregnancy complications listed among the toxemias will not be included. Also not included are the various forms of blood pressure elevation such as are found in valvular heart disease, hyperthyroidism, et cetera. Hypertension, albuminuria and edema are the classical findings in preëclampsia and eclampsia, the so-called "true" toxemias. They are also found in nephritis, and in pregnancy complicated by essential hypertension or arteriolosclerosis. The relationship of the acute toxemias to the production of permanent hypertension is the phase of the general problem which has been of most interest of late.

These groups of entities do not always occur singly. This is particularly true of the acute toxemias and their frequent superimposition on an already established essential hypertension. For reasons of simplicity the three main groups will be considered individually.

Preëclampsia and Eclampsia

This group of the so-called hypertensive toxemias are peculiar to pregnancy. They occur in patients who, as far as our clinical methods of evaluation are concerned, have normal vascular and renal systems. The high incidence of ultimate permanent hypertension among the group of patients having this complication suggests that these patients may have the substratum for a hypertension which did not become manifest before their toxemia. As yet our clinical methods of evaluation do not permit recognition of this substratum when it is still in the "prehypertension" or subclinical stage. Preëclampsia and eclampsia are considered to be the same entity, varying only in severity. They usually make their appearance in the last trimester of pregnancy. In the absence of permanent vascular or renal pathology, all signs and symptoms disappear by the third postpartum month.

Their etiology still remains obscure. The etiologic agent is thought to arise in the placenta rather than in the fetus. Presumably some substance is liberated which, among other characteristics, causes a rather generalized arteriolar spasm.

In most instances following delivery of the child and placenta, there is a fairly rapid return to normal. Unless vascular or renal pathology were existent before the toxemia or developed during the course of it, most of these patients are left without sequelæ of the disease. Evidence of its presence is usually lacking by the time of the three months' postpartum examination.

The severity of the disease has been adjudged by the arbitrary choosing of blood pressure levels. A systolic pressure over 140 and/or a diastolic pressure over 90 mm. Hg. are accepted as pathological levels. Mild and severe preeclampsia are determined on the basis of the systolic pressure being above or below 160 and/or the diastolic pressure being above or below 100 mm. Hg. If convulsions or coma ensue, the diagnosis becomes eclampsia.

Glomerulonephritis

The term chronic nephritic toxemia has led to considerable confusion. Its use has been largely abandoned because most patients so diagnosed have been shown to have arteriolosclerosis which is indistinguishable from essential hypertension.

Glomerulonephritis presents a very specific problem. It occurs as a complication of pregnancy only coincidentally. There is no evidence to support the theory of relationship between the development of chronic glomerulonephritis and the acute toxemias. Fortunately, acute glomerulonephritis occurs in association with pregnancy only rarely. The added load of pregnancy

Read in Symposium on Obstetrics at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 29, 1942.

on kidneys so affected leaves little hope for the patient's survival unless the pregnancy is interrupted. Fortunately many patients recover from acute glomerulonephritis. Following the healing of the acute nephritis, if a chronic glomerulonephritis has not developed, a pregnancy may be again undertaken and will usually progress uneventfully. Chronic glomerulonephritis, on the other hand, never permits complete recovery. Here, also, allowing a pregnancy to continue in a patient so affected would invite certain maternal disaster because of the rapid advancement of the nephritis caused by the added burden of pregnancy.

Essential Hypertension
(Arteriosclerosis)

Of recent years a voluminous literature has appeared on the relationship of pregnancy to permanent hypertensive disease. More specifically the relationship of the acute pregnancy toxemias to this condition has received much attention. The incidence of permanent hypertension among patients who have had the acute toxemias has been shown to be so high that steps toward prevention of essential hypertension have become an integral part of toxemia of pregnancy management.

The finding of an elevated blood pressure in the first months of pregnancy in the absence of other rare and demonstrable causes means arteriolosclerosis. Pregnancy hastens the advancement of the disease. Frequently an acute toxemia becomes superimposed. The functional arteriolar spasm in the latter condition occurring in arterioles already narrowed by permanent sclerosis augments the symptoms markedly. Usually after delivery these patients have basal blood pressure levels higher than before the pregnancy.

Diagnosis of permanent hypertension can usually be made by the finding of the hypertension early in pregnancy and by the observing of the sclerotic process in the arterioles of the ocular fundi. Occasionally the diagnosis cannot be made with certainty until in the puerperium. Persistence of the blood pressure elevation in the remote puerperium in the absence of other causes of hypertension means arteriolosclerosis. The frequency of its occurrence following preëclampsia and eclampsia and the importance of limiting reproductivity in patients having permanent blood pressure elevations makes the necessity for taking postpartum blood pressure readings quite obvious.

Recently ninety-four patients having had a hypertensive toxemia of pregnancy treated at University Hospital five to ten years previously, were re-examined. 45.74 per cent of these patients were found to have arteriolosclerosis.

The importance of recognizing the presence of arteriolosclerosis and in preventing subsequent pregnancies can best be demonstrated by the Johns Hopkins Hospital material. Following a diagnosis of arteriolosclerosis on their obstetric wards, a corrected ten-year mortality rate of 17.5 per cent was demonstrated. Patients in this group that had a subsequent pregnancy, had a corrected mortality of 39.5 per cent.

Conclusions

Thorough physical examination of obstetrical patients early in their pregnancies is imperative. The finding of an elevated blood pressure demands a careful search for the underlying cause in order that proper treatment may be administered. Patients not seen until late in their pregnancies often present a more complicated problem because of frequent superimposition of an acute toxemia on an already developed arteriolosclerosis.

Careful observation of blood pressure levels in the puerperium is of equal importance. In the light of present knowledge, limitation of reproduction is strongly urged in patients with permanent blood pressure elevations.

DEAFNESS IS SOMETIMES DUE TO ALLERGY

Hearing can be improved or restored in some hard of hearing patients by allergic treatment, Dr. Hugh H. Kuhn, of Hammond, Indiana, told the Fifth Annual Forum on Allergy at Cleveland. Not all deafened patients can be helped. In some cases, however, characterized by variation in the degree and time of hearing loss—patients, for example, who hear better on some days and worse on others—the cause may be an unsuspected allergy which causes a swelling of part of the hearing mechanism with consequent loss of some hearing.—*Science News Letter,* January 23, 1943.

USE OF THE SULFONAMIDES IN PREGNANCY

MELVIN B. SINYKIN, M.D.
Minneapolis, Minnesota

WITH the advent of sulfanilamide and its related compounds, almost immediate clinical application was found in the field of obstetrical infections. The dreaded puerperal infections, commonly due to the beta hemolytic streptococci, were found to respond with almost spectacular results and as early as 1937 a marked reduction in fatality rates, even after blood stream invasion, was reported[2] from the isolation division of the Queen Charlotte's Hospital in London, where sulfanilamide and prontosil were used in every case of puerperal sepsis starting in 1936. Since then the discovery of derivative drugs has been so rapid as to make it difficult to determine which drug to use. The newer drugs, especially sulfathiazole and sulfadiazine are much less toxic and possess a bacteriostatic effect upon a much wider range of organisms than does the parent drug, sulfanilamide.

Probably nowhere has the use of sulfonamide drugs been more welcome than in the treatment of puerperal and postabortal infections. The beta hemolytic streptococcus, largely responsible for the severe form of the disease, is almost specifically inhibited in its growth by the sulfonamides, but other organisms such as the nonhemolytic or anerobic streptococci are more resistant. Sulfathiazole and sulfadiazine, in addition to having less of the unpleasant side-reactions of sulfanilamide, attack a wider range of organisms and have thus become the drugs of choice. In the occasional case an idiosyncrasy to these newer drugs may justify the use of sulfonilamide. The only other advantages of the parent drug are: first, it is less expensive, costing about half as much as sulfathiazole and one-fourth as much as sulfadiazine; and, second, it is more soluble, thus obviating the precipitation of crystals that may occur in the urinary tract with the use of the newer drugs. The first advantage mentioned becomes unimportant when human life is held in balance, and the second avoids a danger that can be minimized by methods of control to be mentioned later.

It is essential to start the drug early in the course of infection before bacterial invasion occurs with development of pelvic thrombophlebitis, pelvic abscess, pelvic cellulitis or peritonitis. Tissue changes cannot be reversed once they are established and they act as a protective barrier for the organisms against the effect of the sulfonamides. The invading army must be counter-attacked before it has a chance to fortify its new position.

Sulfonamides should be started as soon as the diagnosis of generative tract infection is made. Following the first twenty-four hours after delivery, a rise of temperature to 100.4° F. or higher on any two days of the immediate puerperium should make the diagnosis probable when extra-genital disease can be eliminated as a possible cause. With the first rise in temperature a culture of the uterine cavity should be taken and the type of infecting organism determined. If the culture is taken within five days of delivery, the information is more reliable than later when secondary invasion from the vagina may confuse the picture. The choice of a sulfonamide drug should be determined by the type of infecting organism. However, when the infection is severe, either sulfathiazole or sulfadiazine may be started before the report of the culture is returned.

At the University of Minnesota Hospitals sulfadiazine has become the drug of choice for almost all obstetrical infections. In addition to being more pleasant to take, it is rapidly absorbed and slowly excreted, and so allows a rapid rise in the blood concentration of the drug and a maintenance of the desired blood level with less frequent dosage. This permits uninterrupted sleep for the patient and decreases the nurses' burden. By the same token blood levels may rise rapidly and frequent determinations of these are necessary to maintain the desired blood level of 10 to 15 mgm. per cent. This level is usually reached when 3 to 4 grams are given as the initial dose followed by 1.0 gm. every four hours for the first 24 hours and 1.0 gm. every six hours thereafter. Sulfathiazole is still the drug of choice when infection is due to the gonococcus or staphylococcus. Dosage is the same and

Read in Symposium on Obstetrics at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 29, 1942.

the desired blood leved to be maintained is 6 to 10 mgm. per cent. Blood levels should be checked daily for three to four days, and every second day thereafter. It should be emphasized that the sodium salts of sulfadiazine or sulfathiazole may be given parenterally when necessary, as a 5 per cent solution in distilled water intravenously or as a .3 per cent to .8 per cent solution in saline hypodermically. The injections may be repeated every twelve hours and require frequent blood level determinations for adequate control. Rectal administration is unsatisfactory because of the irregular and unpredictable rate of absorption.

The drugs should be continued in decreased dosage for several days after the temperature has dropped and clinical improvement is manifest. During administration, all possible supportive measures should be used. Small blood transfusions will augment the patient's resistive powers when the infection is severe. Adequate fluid balance should be maintained and recorded, the minimum fluid intake being 3,000 c.c. daily and urinary output best maintained at 1,000 c.c. The latter is important not only as a supportive measure, but to prevent concentration of the urine with its attendant precipitation of crystals of the acetylated sulfonamide.

Although the danger of urinary tract obstruction is believed to be less with sulfadiazine than with sulfathiazole, several cases of anuria due to sulfadiazine have been reported in the literature, two within the last few weeks.[1,4] The mechanism of this anuria production may be obstruction of the convoluted tubules, kidney pelvis, and ureter due to precipitated crystals, combined with toxic degeneration of the lining of the convoluted tubules. The condition may be avoided by discontinuing the drug and forcing fluids when a marked fall in urinary output occurs or with the discovery of red blood cells together with acetylated sulfonamide crystals on microscopic examination of the urine. The appearance of the crystals alone is no indication to stop the drug. If anuria persists, catheterization of the ureters and frequent irrigation of the kidney pelvis is recommended. The crystals are more soluble in alkaline solution. This has led to the suggestion that sodium bicarbonate be given with each dose of sulfathiazole or sulfadiazine to alkalinize the urine and thus make the precipitation of crystals less likely.

Sulfonamide drugs have also been of great value in the treatment of urinary infections during pregnancy and the puerperium. It has long been known that when urinary infection is once established in pregnancy, it is nearly impossible to sterilize the urinary tract with the ordinary urinary antiseptics such as methanamine or mandelic acid. The sulfonamide drugs, sulfadiazine and sulfathiazole in particular, now permit complete elimination of the usual infecting organisms in most cases, when dosage of 1 gm. every six or eight hours is given for a period of ten days. The desired blood level when sulfadiazine is given is 5 to 8 mgm. per cent and for sulfathiazole 3 to 5 mgm. per cent. In more severe cases the sepsis dosage may be necessary. The colon bacillus group is readily eliminated from the urine but an occasional case due to infection with the streptococcus fecalis, streptococcus proteus, or streptococcus viridans may be resistant even with maximal dosage of sulfonamides. In such cases reversion to mandelic acid or methenamine may be more effective. Clinical cures should not be accepted as final. The catheterized urine should be cultured after the course of therapy and three negative cultures at monthly intervals used as a criterion of cure. This is demanded by the frequency with which chronic changes occur in the urinary tract following pyelocystitis of pregnancy.

Cultures of the urine should be taken in every prenatal patient who has a previous history of pyelitis, even though no pus can be found in the urine. If the culture is positive, a course of sulfonamide therapy should be given since that patient has a 40 per cent chance of developing pyelitis, even though no pus can be found in the rent attacks have been shown to lead to fibrosis in the wall of the ureter with production of the so-called fixed ureter, and chronic persistent infection of the urinary tract. The treatment of urinary tract infections should be directed toward sterilization of the tissues rather than urine. For this reason dosage should be followed by blood levels rather than urinary levels of the drug. In the occasional case of pyelo-ureteritis during pregnancy, it may be advisable to catheterize the ureters, and when evidence of kidney damage heralds the onset of pyelonephritis, immediate interruption of pregnancy is indicated. Fortunately these radical methods of control are only rarely necessary since the advent of the sulfonamides.

Gonorrhea may now be cured in 90 per cent of cases during pregnancy. Sulfathiazole is the drug of choice and should be given in large dosage—directed to maintenance of a blood level of 7 to 10 mgm. per cent over a period of ten days. The patient is best hospitalized and therapy followed by culture study. This should then be repeated at monthly intervals for three months, each resulting in no growth, before cure is pronounced. Culture for gonococci has been found much more reliable than the smear.

Breast infection may respond to sulfathiazole or sulfadiazine therapy if the drug is started before abscess localization has occurred. At the University Hospital x-ray therapy has been combined with chemotherapy in an attempt to abort breast infections before abscess formation. The results have been favorable in the cases so treated, but it is essential to start treatment within a few hours of onset.

Sulfonamides have been shown to pass through the placental circulation to produce a blood level in the fetus equal to that of the mother. This has not been found harmful to the fetus or newborn and does not constitute a contra-indication to the use of the drugs during pregnancy. However, the potentiality of damage to the fetus is present and one case of hemolytic anemia of the newborn[3] has been attributed to sulfonamides received by the mother before delivery. Transmission of sulfonamide to the infant by nursing occurs in such small concentration that neither therapeutic nor toxic effects are likely.

The prophylactic use of sulfonamides may be of value in cases of prolonged labor, intrapartum infection, or potentially infected abortion. Some investigators have advocated the use of these drugs routinely for several days after delivery, but the results are too questionable and the dangers too real to justify such a widespread procedure.

The local application of sulfonamide powder finds little indication in obstetrics but may be useful in preventing infection in the repair of third degree perineal lacerations extending into the rectum or when local contamination of the peritoneal cavity is suspected at the time of cesarean section.

Whenever large doses of any of the sulfonamide drugs are given, toxic reactions are possible and should be guarded against by every available laboratory facility. Kidney function should be determined by means of a phenol-sulphonephthalein test or blood urea nitrogen and therapy should be preceded by complete blood count and urinalysis, the former repeated every second day and the latter daily. Particular attention should be paid to early signs of hemolytic anemia, agranulocytosis and kidney damage. It should be remembered that the sulfonamides may cause liver damage, and one should proceed with caution when it is necessary to use the drug in the presence of jaundice of hepatic origin. Drug fever has been a bothersome complication, but is fortunately less common since the newer sulfonamides came into use. It should be suspected when a rise in fever occurs in a patient after apparent clinical improvement. The drug should be stopped if no other reason for the fever is demonstrable. This will result in a gradual fall in temperature over the next twenty-four to forty-eight hours. Other toxic manifestations that may result from sulfonamide therapy are dermatitis, peripheral neuritis, toxic psychosis and gastro-intestinal upsets. Whenever a toxic reaction occurs, the patient should be warned of her idiosyncrasy to the sulfonamides for her future protection.

The current Minnesota Maternal Mortality study has revealed some shortcomings in the management of sulfonamide therapy. The most common error was the failure to employ bacteriological study as a control for the choice of sulfonamide used. In most of these cases, facilities for such were available. Unwarranted delay in starting chemotherapy may have been contributory to the fatal issue in at least two cases, while totally inadequate dosage was used in others. In one patient a dose of 5 gr. of sulfonamide four times a day was given for severe puerperal sepsis and in another 45 gr. of sulfathiazole was given rectally, daily, in a patient who finally succumbed to peritonitis following puerperal sepsis. It should be emphasized here that full dosage is imperative if therapeutic results are to be expected. Sulfathiazole was given orally to one patient while nasal suction apparatus was in operation; a rather round-about method of sterilizing the contents of the apparatus.

Finally it is quite apparent that full advantage is not always taken of available laboratory facilities to insure early detection of reactions should they occur. Frequent blood counts and daily

urinalysis should be routine in patients receiving full sepsis dosage.

We should remember that our new therapeutic ally carries a double-edged sword which can be directed against the patient as well as against the disease.

References

1. Bradford, H. A., and Shaffer, J. H.: Renal changes in case of sulfadiazine anuria. Jour. A.M.A., 119:316-318, (May 23) 1942.
2. Colebrook, L., and Purdie, A. W.: Treatment of 106 cases of puerperal fever by sulfanilamide. Lancet, 2:1237, (Nov. 27) 1937; 1291, (Dec. 4) 1937.
3. Heckel, G. P.: Chemotherapy during pregnancy; danger of fetal injury from sulfanilamide and its derivatives. Jour. A.M.A., 117:1313-1316, (Oct. 18) 1941.
4. Schulte, J. W., Shidler, F. P., and Niebauer, J. J.: Acute urinary suppression following sulfadiazine therapy. Jour. A.M.A., 119:411-413, (May 30) 1942.

OBSTETRICS IN THE HOME

E. S. PALMERTON, M.D.
Albert Lea, Minnesota

IN the preparation and reading of this paper I am quite aware that a large number of Minnesota doctors deliver women exclusively in hospitals. Literature and research on obstetrics appear to be addressed pretty much to this type of practitioner. If a doctor wishes to inform himself on new steps applicable to home deliveries he is forced to search out infrequent articles, or, what is somewhat disconcerting, a nursing textbook on obstetrics.

With each year passing, a larger percentage of deliveries occurs in hospitals, and this is as it should be. Every doctor wants the general advantages and above all the safety of the hospital for his maternity cases. However, the fact remains that home deliveries form a real and considerable part of many doctors' practices. Is home obstetrics to be considered primitive and regrettable, to be discouraged and stamped out as fast as possible?

For the United States in 1939, the number of home cases almost equaled the hospital cases. Certain states had less than 20 per cent of the mothers delivered in hospitals—Alabama, Arkansas, Kentucky, Mississippi, South Carolina, and West Virginia. At the other end of the list are those with 80 per cent to 90 per cent of mothers being confined in hospitals: Connecticut, New York, Washington, California, Massachusetts and New Jersey. Minnesota's figures for that year were 64 per cent hospital cases, 36 per cent delivered in the home. In 1941, of the 55,622 deliveries in our state, over 15,000, or nearly 28 per cent, were home cases.

Certain areas of our state are sparsely settled and hospital care for the pregnant woman is often impossible. In the more thickly settled areas there will be found certain women who choose to have their babies at home. The chief reason for this is economic. Most of these families are not receiving charity; they proudly and painfully pay necessary expenses. Hospital care which can possibly be avoided is not on their budget. If M.D.s refuse to give these perfectly good patients care in their homes, the grandmother or the neighbor, or (what may be fully as undesirable) the osteopath or chiropractor will take charge. In our county of Freeborn the cultists are delivering a small but persistent percentage of home cases. They are to a certain extent cases which the M.D., some M.D., has cast off politely—I know this to be true from experience. The sloughing, unintentional though it be, of home confinements to the cultists is an obvious menace, for the mother will thereafter go to the man who has delivered her for other conditions for which she or her family may need care.

Those of us physicians, then, who have anything to do with obstetrics in the home have an obligation to make the home case comparable to that in the hospital, first from the standpoint of safety, then, as much as possible, comparable in comfort and convenience for our patients and ourselves. It is perfectly possible to carry many of the recent advances in obstetrics to a home case.

I shall touch upon the following with reference to home delivery, reminding you that I have neither time nor desire to discuss these points fully:

Read in Symposium on Obstetrics at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 29, 1942.

1. Maintenance of technique.

2. Variations in management with principal reference to drugs:

(a) Anesthetics and analgesics. (b) Vitamin K. (c) Sulfonamides. (d) Oxytocics.

3. Emergency measures for shock.

4. Training new doctors in home obstetric practice.

Maintenance of Technique.—The home case is usually unaccompanied by the frills but need not be without the essentials of good surgical technique. Sterile supplies ready beforehand range from the large pack, complete with sheets, drapes, gowns and towels safely autoclaved, to virtually nothing. It is worth noting that in the work of the Chicago Maternity Center (of which more later) nothing sterile is carried along to the home except towels, cotton and gauze. Gowns are not used. However, the operators are capped and masked. Gloves and instruments are boiled together. Much use is made of newspapers for ordinary cleanliness, and a cone of newspapers pinned at the foot of the operating table (usually a kitchen table) serves in place of a Kelly pad. The patient is prepared by perineal shaving, and the vulvar area cleansed with green soap, then 1 per cent lysol solution, and finally 1 to 500 bichloride solution. When ready to work a sterile towel is slipped underneath the buttocks, and this area, the vulvar area and the pans of instruments and sterile solutions, constitute the clean areas and every effort is bent to keep them clean.

There is a rather pertinent argument against elaborate draping in the home. The so-called sterile field thus created is not understood by lay helpers, and it is almost sure to be contaminated when the physician is not looking. Unless the personnel is trusted by the doctor he might better leave thighs and abdomen bare than have them covered by clean sheets he knows are not sterile.

In some counties in this state, the Red Cross or the county nurse supervises the putting up of packs for home confinements. These are usually autoclaved without charge in a nearby hospital. If autoclaving of such bundles is not possible, they may be baked in an oven for two hours at 320 degrees Fahrenheit. The contents of these bundles vary, but the pack I have used contains two bedpads constructed of newspaper backed on one side with muslin, a half dozen home-made perineal pads, a package of cotton pledgets and a bundle for the baby containing gauze squares, tape and belly band, and a receiving cloth for the baby. A sterile pack of this sort is a great comfort to a doctor no matter what type of home he enters for a confinement; it is especially comforting when he is called, as happens not infrequently, to deliver a perfect stranger in wretched surroundings, the mother having made exactly no preparation for confinement.

Many very good and able physicians do not shave the perineum. These same doctors will shave a portion of the scalp before stitching a laceration there, or they will shave an axilla before removing a gland—surely their logic breaks down when they aver that it is not necessary to shave away the pubic hair.

Throughout a home delivery it is important for the physician to keep from bringing a new strain of organisms into contact with the mother and baby. It is generally held that people are fairly well immunized to their own germs; there is real danger in bringing foreign organisms to them. In this regard it is felt that in many cases the doctor who takes adequate care in the home actually exposes his patient to less risk of foreign infection than if she is delivered in a general hospital, especially a small one where two or three nurses are obligated to care for all types of cases in addition to the maternity group.

Drugs for Anesthesia and Analgesia.—In this regard I have little to say that is new. The doctor usually carries barbiturates, morphine, and scopolamine for analgesia; for anesthesia, ether and chloroform. Chloroform may be required in cases where an open flame is near or the patient has an acute cold. There are types of equipment available whereby nitrous oxide, or even cyclopropane, may be used in the home. I have had no experience with such equipment.

To the above mentioned agents I wish to add with enthusiasm: procaine for local or block anesthesia. This is common enough in hospital work. It can be added very easily to the routine equipment carried to all home cases. Often it does away with the necessity of making use of an inexperienced, frightened anesthetist.

Vitamin K.—The doctor will do well to carry ampoules of one of the water-soluble Vitamin K preparations when he goes to home deliveries.

You know of the discussion pro and con regarding its routine use. I, for one, do not give it to every mother in labor—but use it prophylactically for the instrumental case, the breech, the premature and the infant I fear to be very large.

Sulfonamide Drugs.—I do not intend to discuss the oral use of these drugs, but will mention their local use in lacerations and episiotomies and on the umbilical stump. If a doctor, because of the setup in the home, feels a weakness in his technique, he has a powerful trouble-shooter in sulfanilamide or sulfathiazole powder. If he is caught with the necessity of packing a uterus, he can, in a moment, incorporate one of these substances into the folds of his pack. In order to make available what has been regarded as a brilliant advance in surgical practice in general, the doctor on home confinement has only to take a bottle of the drug along.

Oxytocics.—The doctor conducting a home delivery has a faithful friend in the ampoule of ergot which may on occasion be used intravenously. He should never be without it; its use by vein is not considered dangerous and it should be used after a prolonged second stage with an atonic uterus resulting, after operative delivery with exhaustion or near exhaustion, or after delivery in which the patient has had very much general anesthesia. As for pituitrin, pitocin, thytuitary and the like—these agents have no broader uses in the conduct of labor at home than in the hospital.

Measures for Shock.—I carry a flask of saline with 5 per cent glucose together with a little package of sterile tubing, connections and needles for infusion. This is not expensive—the investment is only about two dollars and it may be very valuable when shock threatens or appears without warning. Plasma may likewise be bought and carried for emergencies—when in the dried state it is stable and need not be kept cool.

Finally, a few words about training new doctors with respect to home deliveries. These points may not be so apropos during the time when most of our medical graduates are joining the armed forces—but when the war is over there will still be home obstetrics.

I had my first home delivery after I had gone into private practice. I am loyal to my school, which is the University of Minnesota; however, I am disappointed in having had no opportunity for training in home obstetrics as a student. Such training gives the student invaluable experience in the following ways:

1. He sees the course of labor more thoroughly than he ever would in a hospital. He gets to know signs of exhaustion and other dangers as they appear instead of leaving them as often happens, for a nurse to discover and announce.

2. His ability to set up and maintain surgical technique is severely tested, much to his eventual benefit.

3. As a corollary to the foregoing, he learns to do without: the best possible light, the greatest possible variety of instruments, and as many pairs of hands as he thinks he needs. Whoever has not repaired a perineum by flashlight, and repaired it satisfactorily, has missed a certain feeling of accomplishment.

The outstanding example of training for home deliveries in this country is the Chicago Maternity Center, a service founded shortly after 1930 and now taking care of 3,000 deliveries a year. In seven years the mortality of the mothers was 1.5 per thousand live births. There was a gross fetal mortality of 3 per cent. Of course, all abnormal cases found in the prenatal clinics are excluded from this home care, and hospitalized. Of those considered normal however, before labor starts, all are delivered in the home, and operative deliveries are done without hesitation when indicated (their operative incidence is 6 per cent). Only those cases complicated by abruptio or previously unrecognized placenta previa are taken in labor to a hospital. Even the acute stages of eclampsia are managed, by choice, in the home. It is obvious that the student who has training on this sort of service will learn technique and self-reliance, if he is capable of learning it under any circumstances.

In conclusion, I have no desire to glorify home obstetrics. The increasing trend in hospitalization of maternity patients is to be desired by all. However, I have attempted to remind the medical profession that home obstetrics is not extinct, nor will it be for a long time. Furthermore, it is possible to bring to the home delivery a large number of the improvements which we have made in obstetric care, as regards technique and preparation for the event of delivery,

as regards certain useful drugs and the measures which we feel must be available wherever there is any likelihood of a patient's going into shock.

Finally, I ask for training in home obstetrics for the medical student, for more than passing attention to this type of practice in the literature, and for appropriate emphasis on the problems of home obstetrics in postgraduate studies.

THE MANAGEMENT OF OCCIPITOPOSTERIOR POSITIONS

WILLIAM C. KEETTEL, M.D.

Obstetrical Consultant, Wisconsin State Board of Health

Madison, Wisconsin

THE most frequent question that is asked me by the general practitioners of Wisconsin is, "How do you handle occiput posteriors?" It is realized that numerous excellent articles have been written on this subject. However, it seems as if many of the more recent articles have tended to confuse rather than to clarify how best to manage this complication. Recently I saw several physicians in rural areas who were greatly alarmed because they had no facilities to make x-ray studies of the pelvis, so they might classify the type of pelvis and in this way know whether to deliver the baby as an occiput posterior or to rotate it to an anterior position should difficulty arise. For this reason it is felt a brief review of the management of this rather common complication might be in order.

The incidence of occipitoposteriors varies greatly; it would seem as if the number reported depends entirely on the time during labor when the diagnosis is made. Calkins,[1] who has made an extensive study of fetal positions, made his initial examination early in the first stage of labor. He reports an almost equal distribution of anterior and posterior positions. On the other hand, when the initial examination is made late in the second stage of labor, the number reported is extremely small, for only the complicated ones, that is those that have failed to rotate, are recognized. The 85 to 90 per cent of occiput posteriors that rotate spontaneously go unrecognized. Because of this fact occipitoposteriors, to many of our physicians, are a dreaded complication.

It is stated by most leading authorities that the head enters the pelvis either in the oblique or in the transverse diameter. Why occiput posteriors occur and why spontaneous rotation to an anterior position does not always take place has been the subject of much speculation. Many theories have been advanced which are beyond the scope of this discussion. Suffice it to say that spontaneous anterior rotation, through an arc of 135 degrees, does occur in 85 to 90 per cent of the cases. This rotation is usually completed during the second stage of labor when the head is on the pelvic floor. To the remaining few that do not rotate spontaneously three things may happen: some will start to rotate but will become arrested in the transverse position; another group will remain either as a right occiput posterior or left occiput posterior; and lastly, a few will rotate posteriorly becoming a persistent occiput posterior, or an occiput sacral position, as it is called by others.

The proper management of a given case begins with the diagnosis of position, and careful abdominal examination is very helpful. Usually one feels the back deep in the right or left flank; the fetal small parts are prominent and are located well anteriorly. The point of maximum intensity of the fetal heart is located most frequently in the flank. However, if the head is not well flexed, the chest will be thrown anteriorly, and then the fetal heart will be heard best in the anterior quadrant of the abdomen.

The course of labor may occasionally give presumptive diagnostic signs, particularly in those cases where the head is slow in rotating. The signs that are most frequently mentioned are early rupture of the membranes, a head that is poorly fixed in the pelvis but not engaged, excessive lumbar pain, and poor, irregular uterine contraction coupled with slow dilation of the cervix. These signs are by no means constant

Read in Symposium on Obstetrics at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 29, 1942.

and are not considered as prominently as they once were.

In addition to the usual findings noted on rectal examinations such as the degree of cervical dilation and effacement and the station of the head, one frequently is able to determine the location of the posterior fontanale and the oblique in which the sagittal suture is located. However, in many instances one is not sure of the diagnosis; for these cases we reserve the sterile vaginal examination to be done when it seems interference is advisable.

Frequently when the caput succedaneum is well formed it is impossible even by vaginal examination to identify for sure the anterior fontanale with its four converging suture lines, or the posterior fontanale directed toward one or the other sacro-iliac synchondrosis. In these cases one feels for the posterior ear, thus determining the position of the occiput. Another procedure that is often helpful is to palpate over the area which you anticipate is the frontal region; if it is, the two frontal bones will give a sensation of crepitation, while the single occipital bone will not. In any of these examinations one must be very careful in estimating the station of the head, for if there is a large caput succedaneum present, the head appears to be more deeply engaged in the pelvis than it actually is.

As many obstetricians have mentioned, the treatment of occipitoposteriors begins during the first stage of labor. This is particularly true when this stage of labor is prolonged. Everything possible should be done to conserve the patient's strength as fatigue is an important factor in uterine inertia, postpartum hemorrhage, and puerperal infection. The woman should receive adequate sedation in safe amounts, using an analgesic drug and not a hypnotic. The fluid and dietary intake should be carefully maintained. The bladder should be watched, and if the patient is not able to void, she should be catheterized regularly. The fetal heart should be checked at regular intervals, as marked irregularity or slowing of the heart between pains is significant.

It is rarely necessary to interfere before the first stage of labor is completed. In fact, it is the conviction of many that a great number of the difficulties encountered are due to attempts at delivery before the cervix is completely dilated. In the rare instances where delivery is necessary before the first stage of labor is completed, one must resort either to the hydrostatic bag, or, if the cervix is well effaced, Dürhssens incisions, to complete the cervical dilatation. Delivery is then effected by forceps or version and extraction. Manual dilation of the cervix is no longer considered a desirable or safe procedure.

Cesarean section is never indicated solely for occiput posterior positions. However, cesarean sections are sometimes necessary where there is some other complication present which necessitates an operative delivery. Then the cesarean section is done because of this complication and not because of the fetal position.

The small number of posteriors that have failed to rotate or have only partially rotated frequently give rise to complications during the second stage of labor, most frequently in the form of prolongation of this stage. However, it is well to remember that anterior positions and face and brow presentation also give rise to prolongation of this stage of labor. When delivery is necessary at this time it is done because of some maternal or fetal complications and not because of the position of the fetal head.

The length of time one should wait in the second stage of labor before interfering has been the subject for much discussion. A favorite expression of Dr. Harris,[2] which is particularly true in these cases, is, "We cannot practice sound obstetrics by the calendar or by the clock." Each patient must be individualized; we must be guided by the condition of the mother and the baby, the progress of labor, and the station of the fetal head.

If the head is high in the pelvis, that is above the ischial spines, we will not interfere until the condition of the mother or baby demands it, or until the head has descended to a lower level. If the head is in the mid-plain of the pelvis or slightly lower, we will interfere if there has been no progress after a reasonable length of time, perhaps two hours. When the head is on the pelvic floor, the time interval will, of course, be shorter. It seems to me that the dictum, "watchful waiting," is most important and in most instances will certainly reduce both maternal and fetal complications, but it might well be amplified to include, "Watchful waiting but never neglect."

When the physician decides that it is necessary to terminate the labor, he determines by a very careful vaginal examination exactly the position of the fetal head. If he finds an occiput pos-

terior, he is confronted with the problem of rotating the head in the safest manner.

It is always best to try manual rotation of the head first, because it is impossible with your hand to produce vaginal tears or trauma to the baby's skull. The difficulty with manual rotation is not the actual rotation but the maintaining of the head in the correct position after the rotation is completed. In order to maintain the head in the correct position several things can be done: (1) place a blade of the forceps beside the baby's head, thus preventing the head from slipping back; (2) place a tenaculum on the baby's scalp; and (3) rotation of the head well beyond the mid-line. The rotation should be done at the level the head has reached in the pelvis, or, if this is not possible, it may be necessary to push the head up slightly. However, one of the main dangers with this procedure is pushing the head too far out of the pelvis, and either losing control of the head, or producing a prolapsed cord.

In a few instances manual rotation will fail, and then one must resort to forceps rotation. The Scanzoni maneuver or double applications of the forceps is the most common method employed. In performing this maneuver one must keep in mind all of the general principles of forceps delivery. In addition there are several other points to consider. The rotation is best accomplished as downward traction is applied; this simulates spontaneous rotation which occurs on the pelvic floor. The handles of the forceps should not be twisted as one twists a piece of rope, but one should always describe a large arc with the handles, thus keeping the head well flexed, and also maintaining the tip of the forceps at a more nearly fixed point. Bill's modification of the Scanzoni maneuver also has many advocates. He maintains that the rotation should be accomplished either at the level of the head or at a slightly higher plane. The Kjelland forceps is advocated by many clinics in the management of the transverse arrests and occiput posteriors. However, the typical Kjelland application, with the rotation of the anterior blade in the uterine cavity, can be a very dangerous procedure if the individual is not thoroughly versed in the use of this instrument. De Lee's "key in lock" maneuver is also used by many physicians with excellent results, but care must be exercised because one blade is placed over the baby's face at some time during this procedure.

Occasionally it may be impossible to rotate the head through 135 degrees to an anterior position; then one tries rotating the head to a posterior position and delivering as such. In such instances one must remember that a larger diameter of the fetal head is presenting and that extensive pelvic lacerations may be produced unless a deep episiotomy is performed. However, delivery as a posterior is necessary infrequently. The only other time it does occur is in the case of mistaken diagnosis, and I may assure you this happens occasionally to most honest obstetricians.

Version and extraction is rarely necessary and is reserved for the patient where the head remains high in the pelvis. In this particular instance version and extraction has replaced the high forceps as the method of choice for delivery.

In conclusion, the important points to remember about occipitoposterior positions are:

1. Spontaneous rotation occurs in a high percentage of cases, often going unrecognized.
2. The diagnosis of position is essential in the proper management.
3. During the first stage of labor interference is rarely indicated.
4. The indications for interference during the second stage of labor are governed by maternal or fetal complications and not by the position of the fetal head, per se.
5. Manual rotation of the head should always be tried before using the forceps as a rotator.

References

1. Calkins, L. A.: Etiology of occiput presentations. Am. Jour. Obst. and Gynec., 37:618-621, (April) 1939.
2. Harris, J. W.: Personal communication.

TUBERCULOSIS IN INFANCY

Babies can be infected with tuberculosis during the earliest days of life and such infection in certain cases tends to progress rapidly and often ends fatally. The diagnosis of tuberculous meningitis or generalized tuberculosis in an infant or child should initiate an immediate and intensive search for the source of infection. —A. S. Pope, M.D., *Journal of Pediatrics,* March, 1942.

ECTOPIA CORDIS

H. J. PRENDERGAST, M.D.
Saint Paul, Minnesota

WE feel justified in reporting this case because ectopia cordis is one of the medical rarities. The condition presents such a striking picture and arouses such interest that it is more than likely that all these cases are reported, yet its relative frequency cannot be given with any degree of accuracy. Cosgrove,[3] in 1924, in reporting a case stated that during the twenty years preceding his report not a single case was encountered in the necropsy rooms of the Bellevue Hospital.

In 1938 Ralph N. Barlow, of the Department of Pediatrics, of Washington School of Medicine, reviewed the literature in the *Journal of Pediatrics*, as follows:

"The condition was first described in 1706 by Haller.[5] In 1866 Peacock,[9] cited thirteen cases and reported a fourteenth and in 1904 Ballantyne,[2] mentioned nine additional cases. Cosgrove and St. George,[12] reported a case in 1925, and Wilens and Cutter,[15] reviewed the literature the same year when reporting another case. More recently, in 1936, Kellett,[7] cited eighteen cases and reported a nineteenth. In 1935 Lideny[8] reported a case and in 1936 Wanstrom[13] reported one."

There has been some confusion concerning the exact meaning of the term ectopia cordis, some authors using it to include cases in which the heart is still entirely within the chest cavity but not in the usual position, such as dextrocardia.

Abbott,[1] describes ectopia cordis as "a displacement so that the heart passes out of the thorax and comes to lie either on the outer surface of the body or in the abdominal cavity."

Three types of ectopia cordis have been described according to the location of the heart. Rauchfuss[11] termed them cervical, pectoral and abdominal, while Weese[14] termed them ectopia cordis suprathoracica, ectopia cum sterni fissura, and ectopia cordis subthoracica.

In the pectoral type the lesion is produced by failure of complete development of the sternum. Embryologically, the sternum is formed from bilateral anlages, and failure of the two pieces to fuse causes a fissure sterni with malpositions, principally of the thoracic organs, especially the heart. Schwalbe states that anomalies in the development of the sternum, particularly in the lower animals, is by no means rare and thus anomalous positions of the heart even within the thorax are frequently produced. It is naturally encountered most often in premature or stillborn infants.

Pfaundler and Schlossman[10] state that ectopia of the heart is more of anatomic than of clinical importance. With ectopia the sternum is wholly or partially absent and the skin may be normal or also may be lacking. Ectopia may be an isolated arrest of development or may be but part of an eventration in which the greater portion of the anterior chest and abdominal wall is absent so that the viscera of the thorax and abdomen lie outside of the body. Both ectopia, in which the heart may be covered by pericardium or be completely uncovered, and eventration make it impossible for the child to live.

Cervical and pectoral hearts are considered incompatible with life although infants with the pectoral type may live for several days.

Abdominal hearts are considered compatible with life. Holmes[6] reports an infant that lived for fifteen months to die of empyema. Deschamps[4] reported a case of a healthy soldier whose heart occupied the position of the left kidney.

Case Report

Mrs. H. S., aged twenty-eight, was first seen in her pregnancy on May 28, 1941, at which time she stated that she had not menstruated since April 17, 1941. In 1931 she had had a thyroidectomy, and in May of 1937 she delivered a normal female infant. No history was obtainable of deformities or abnormalities on either her or her husband's side. Pregnancy was uneventful. On January 10, 1942, the fetal heart 122 per minute was heard just to the right of the midline below the navel. On January 29, 1942, she was admitted to St. Joseph's Hospital. The fetal heart 132 per minute was heard in the midline just below the navel during the first stage of labor at 5:30 P.M. After a moderately short labor she was delivered of a live female infant. The presentation was that of a frank

Read before the Ramsey County Medical Society, St. Paul, Minnesota, March 30, 1942.

breech, delivery sacrum right anterior. With the delivery of the legs, a large bluish pulsating mass was felt at the navel. After completion of the delivery we were better able to visualize the abnormality which consisted of a midline defect of the lower anterior chest wall and the upper abdominal wall through which a large mass extended. The extruded mass contained a large pulsating tumor in the superior part and a part of the liver and some bowel in its lower part. The cord was attached at the inferior margin of the defect which measured about 2.5 inches in length and 1.75 inches in width. The infant breathed promptly and color of the skin was good; no other congenital defects were observed. The baby was quite cyanotic at times during the first day and this became increasingly more pronounced so that during the third day of life oxygen inhalations were almost continuous. Its temperature was subnormal throughout its life. The baby took small amounts of glucose and expelled some meconium. Death occurred in sixty-five hours.

Motion pictures, x-ray studies and electrocardiac graphic studies were made and we were fortunate in obtaining permission for a post-mortem examination.

X-rays were taken in the anteroposterior and lateral positions. These show the skeletal development to be complete. The lateral view shows omphalocele containing the heart, liver and the transverse colon.

Treatment.—Cases have been reported in which operations have been performed but in no case has there been a satisfactory result. As this infant showed a cardiac difficulty, as evidenced by cyanosis, it was felt that an operation was contraindicated until she had shown a weight gain and an ability of the gastro-intestinal tract and the cardiovascular system to function efficiently over a period of time, perhaps a month. The presence of one anomaly would cause one to expect others.

Autopsy

External Appearance.—The body is that of a fairly well developed white female infant, length 49 centimeters, weight 2715 grams. There is no edema or jaundice. There is moderate dorsal hypostasis. There is slight cyanosis of the nail beds and of the lips. There is a defect in the anterior abdominal wall measuring about 7 by 4 centimeters. This defect begins just below the xiphoid and terminates at the level of the umbilicus. The umbilicus appears to be incorporated in the defect. Covering this defect is a membrane which appears to be rather thin. Protruding in a hernia-like fashion is a portion of the heart and the liver filling in this defect.

Pleural Cavities.—Upon opening the pleural cavities the heart is noted to be pushing the diaphragm downward and producing the herniation just below the xiphoid process. The heart is above the diaphragm and the liver below it. There is no defect of the diaphragm. The vessels leading from the heart appear to be markedly elongated. On examining the external surface of the heart there appears to be a marked dilation of the right auricle. The heart measures 6 centimeters from the tip of the auricle to the apex of the ventricle. The heart is about 3.5 centimeters wide. At the junction between the right auricle and the ventricle the costal cartilage of the rib is firmly adherent and seems to produce a constriction between the auricle and ventricle at this point. There are adhesions between the anterior abdominal wall and the right ventricle. The adhesions are vascular. Upon closer examination of the heart the right auricle gives the appearance of a balloon with its narrow constricted portion at the junction of the auricle with the ventricle.

Heart.—The heart weighs 31 grams. On opening the dilated right auricle it is noted that there is no communication of the right auricle with the right ventricle. The only communication this portion of the heart has with any other portion is through what appears to be a foramen ovale which has a perforated appearance and bulges into the left auricle a distance of a centimeter or more. There is a remnant of a valve present in the wall of this right auricle but does not appear to serve any function as blood can go to either side of the valve. The left auricle does not communicate with its corresponding ventricle but there is a direct communication of the left auricle with the right ventricle. The right ventricle appears to be dilated. There is a defect in the ventricular septum so that blood in the right ventricle may go through to the left ventricle. Blood in the right ventricle goes out the aorta. Blood in the left ventricle goes out the pulmonary artery. The coronary arteries arise from the aorta which in turn leads from the dilated right ventricle. From the anatomical arrangement of the heart the blood would appear to go in the following directions: blood returning from the peripheral circulation enters the right auricle; from this point it passes through a patent foramen ovale into the left auricle. From here the blood passes to the right ventricle. From there it goes in two directions, some going out the aorta and some going through the ventricular defect into the left ventricle and from there through the pulmonary artery to the lungs. Blood returning from the lungs to the left auricle proceeds directly into the right ventricle. There is some fluid in each pleural cavity. There appears to be some encroachment of the right auricle upon the right lung.

Lungs.—The right lung weighs 20 grams, the left lung 18 grams. On sectioning, both appear to have a moderate amount of edema present.

Liver.—The liver weighs 110 grams. The external surface appears normal. On sectioning, no significant lesions are noted.

Spleen.—The spleen weighs 5 grams. There are no lesions of importance.

Kidneys.—Both kidneys together weigh 37 grams. The external surfaces appear normal. There are no defects noted. The pelves and ureters appear within

normal limits. The pancreas and adrenals appear normal. There are no lesions in the genital tract. The aorta appears to be within normal limits.

Head.—The scalp and calvarium do not show any abnormalities. On sectioning the cerebrum a few areas of petechial hemorrhage are noted in the mid-portion. There are no lesions in the cerebellum or pons.

Microscopic Examination

Lungs.—There is some congestion and pulmonary edema.

Liver.—There appears to be an acute congestion present.

Diagnosis.—(1) Ectopia cordis abdominalis; (2) Pulmonary edema; (3) Passive congestion of the liver.

References

1. Abbott, Maude: Displacements of heart. Osler and McCrae: Modern Med., 4:660, 1927.
2. Ballantyne: Cited by Holmes.
3. Cosgrove, S. A., and St. George, A. U.: Report of a case of ectopia cordis. Am. Jour. Dis. Child., 27:594, 1924.
4. Deschamps: Cited by Abbott.
5. Haller: Cited by Holmes.
6. Holmes, James B.: Ectopia cordis with report of a case in a fifteen-month-old infant. Johns Hopkins Hosp. Rep., 18:287, 1919.
7. Kellett, C. E.: Ectopia cordis cum sterni fissura. Arch. Dis. Child., 11:205, 1935.
8. Ladenyi, Von Julius: Ectopia cordis thoracica and theories of its origin. Anat. Anz., 1935. (German translation.)
9. Peacock: Cited by Holmes.
10. Pfaundler, M., and Schlossman, A.: Diseases of Children. Eng. translation by Shaw and LaFetra. Philadelphia: J. P. Lippincott Co., 3:496, 1912.
11. Rauchbuss: Cited by Holmes.
12. St. George, A. U.: Report of a case of ectopia cordis. Am. Jour. Dis. Child., 27:594, 1924.
13. Wanstrom, R. C.: Fissura sterni with ectopia cordis. Jour. Tech. Methods, 16:88-93, (Oct.) 1936.
14. Weese: Cited by Kellett.
15. Wilens, G., and Cutler, C. D.: Ectopia cordis (Case report). Am. Jour. Dis. Child., 30:76, 1925.

EMBRYOLOGY AND GENETICS IN ECTOPIA CORDIS ABDOMINALIS

F. C. SCHULDT, M.D.

Saint Paul, Minnesota

AFTER the ectodermic and entodermic layers have developed in the early human embryo, there develops between these two layers, irregularly arranged cells, the mesodermic layer.

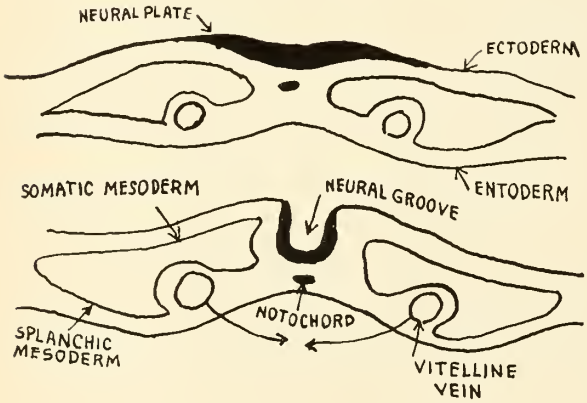


Fig. 1. Early human heart development in its first and second stages.

Very early, in the lateral areas of the embryo a vacuolization develops in the mesodermic layer.[4] These separations of the mesodermic cells extend lengthwise of the embryo and become two laterally placed continuous tubes lined with a single layer of endothelial cells (Fig. 1). These are the vitelline veins destined soon to conduct

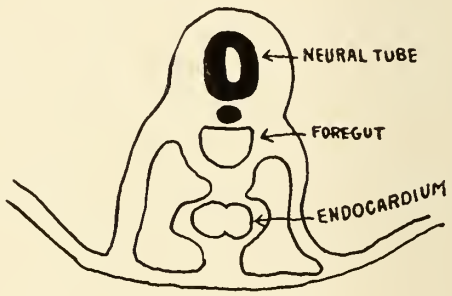


Fig. 2. *(left)* Early heart development in its third stage.

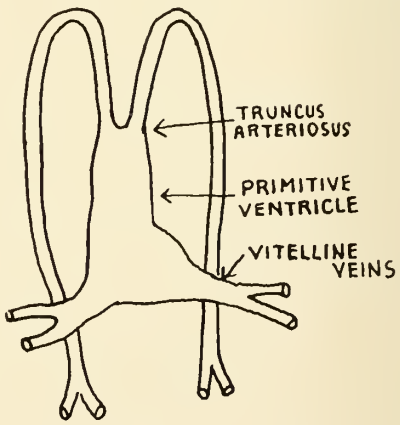


Fig. 3. *(right)* Early heart development in its fourth stage.

the blood stream, the cells of which at this time consist of nucleated red blood cells only. Nu-

Read before the Ramsey County Medical Society, Saint Paul, Minnesota, March 30, 1942.

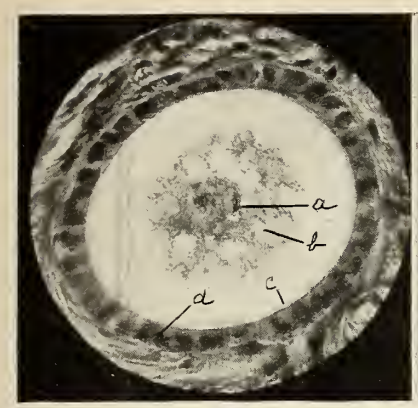


Fig. 4. The human ovum: (a) germinal vesicle; (b) yolk; (c) zona pellucida; (d) corona radiata.

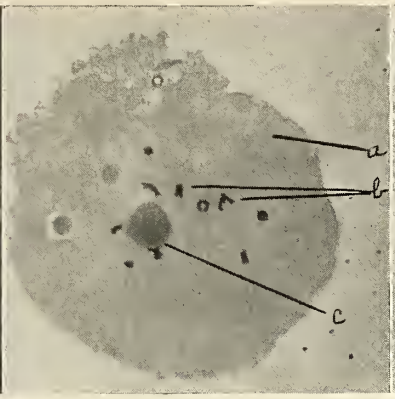


Fig. 5. Corn pollen: (a) the cell; (b) the chromosomes (ten pairs); (c) nucleolus.



Fig. 6. Drosophila melanogaster showing a portion of the x chromosome with a translocation. (a) x chromosomes; (b) the translocation of a portion of No. 3 chromosome.

cleated red cells are present throughout life in all vertebrates, except in mammals.

These parallel vitelline blood tubes approach toward a ventral median line and unite in the region ventral to the head gut[3] (Fig. 2). In normal development the heart is now one tube, with the venous blood traversing headwards through the primitive ventricle, then through the truncus arteriosus and then into the arched branchial vessels (Fig. 3). This united tube now becomes longer and at the same time the neural tube takes on a rapid growth, causing the embryo, which up to now was straight, to curl, so that the tail comes in contact with the brain tube. There is now a very limited space for an elongating tube to remain straight, therefore it is necessary for it to coil on itself. The venous or atrium portion remains fixed, while the primitive ventricle coils ventrad. At this stage the heart in every embryo appears ectopic. Also at this stage the tongue and brain tube rest immediately upon the heart (Fig. 8d). The heart position might be pronounced to be ectopia cordis cervicalis.

A force of the proper gene is responsible for the rotation of the ventricle to the left chest position. Now we have a uniocular heart, a single chamber with no division. At this time a protusion develops from the posterior wall of the heart tube meeting a similar protrusion from the ventral wall, called endocardial cushions (Fig. 8g). These, uniting, form the septum intermedium which causes a division between the atrium portion and the primitive ventricle, allowing for two communicating channels. Now we have a bilocular heart, the organ of the adult fish and the early heart structure of all air-breathing vertebrates. The next stage is a septum development dividing the atrium into right and left side. Now we have a trilocular heart. The final structural change is the septum dividing the ventricle into right and left, which gives us the normal four chambered heart.

Anomalies of the heart are found in 2.8 per cent of children. As a rule the right half of the heart is the seat of congenital anomalies while the left half of the heart is more often affected by disease in later life.

Predisposing causes of anomaly as given by Birnbaum of Göttingen are: (1) venereal disease; (2) intermarriage; (3) tuberculosis; (4) typhoid; (5) fright during pregnancy; (6) fetal endocarditis.

Congenital anomalies of the heart position are: (1) dextrocardia; (2) ectopia cordis (cervicalis-pectoralis-abdominalis).

The case which was reported by Dr. Prendergast* (Fig. 9), is one of a double congenital heart anomaly: (1) an anomaly of position in that it is an ectopia cordis abdominalis (Fig. 10) and (2) an anomaly of structure (Fig. 11). The anomaly of structure is multiple and consists of:

1. Transposition of the aorta and pulmonary artery.
2. Failure of ventricles to rotate.
3. Absence of mitral and tricuspid valves.
4. A partial mitral valve (useless) on the wall of the right atrium.

*Dr. Prendergast's report appears just previous to this article.

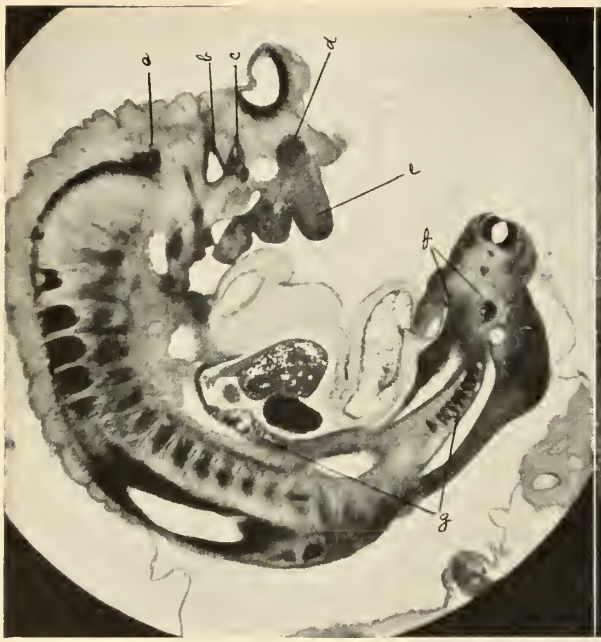


Fig. 7. Lateral sagittal section of a 6 mm. human embryo. (a) ganglionic crest; (b) otic vesicle; (c) acoustic ganglion; (d) Gasserian ganglion; (e) facial processes; (f) anlage of metanephros or permanent kidneys; (g) Wolffian body.

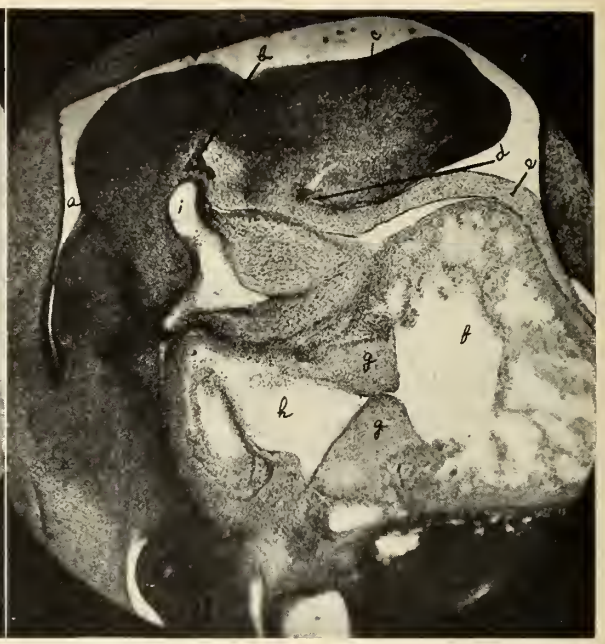


Fig. 8. Sagittal section through neck region of a 6 mm. human embryo. (a) foregut or esophagus; (b) thyroglossal duct, anlage for thyroid; (c) tongue; (d) site of future neck; (e) pericardium; (f) common ventricle; (g) endocardial cushions; (h) common antrium; (i) left common carotid artery.

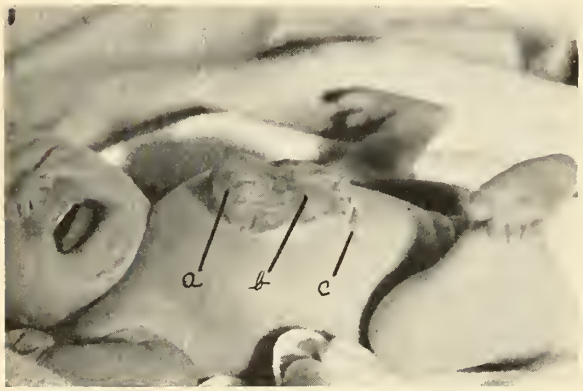


Fig. 9. Infant with ectopia cordis. (a) the ventricles; (b) the colon and liver; (c) the umbilical cord.

5. No communication between the right atrium and right ventricle.

6. No communication between the left atrium and left ventricle.

7. Absence of a ductus arteriosus.

8. Only one coronary artery.

9. Three foramina ovalæ in the interatrial septum.

10. One large opening in the interventricular septum.

11. A diagonal passage from the left atrium to the right ventricle.

12. A very long ascending aorta.

A superficial examination of the baby showed a well developed average new born. The color was good and there were no other deformities. The head and face development was very good. So that one may conclude that the intrauterine existence of the fetus had not been handicapped by all the abnormalities. The circulation apparently had been adequate. For about twelve hours after birth the color remained good. The baby cried occasionally and kicked its legs about like a normal child. The baby did not seem to be in any distress. A colored movie demonstrates this. Later the baby became cyanosed.

Birnbaum classifies single malformations into five classes:

1. Malformations due to arrest of development: fissures, fusion of organs.

2. Malformations due to excess of development: fingers, toes, teeth, ribs, etc.

3. Malformations due to displacement of tissues and persistance of fetal structures: teratomata, dermoids and cysts.

4. Malformations due to errors of development: transposition of viscera.

5. Malformations due to fusion of sexual characters: hermaphroditism.

Death and lethal factors begin at the time the ovum is fertilized. There are many disturbing influences to the developing fetus which depend either upon internal causes or the action of external influences. A trauma to the abdomen severe enough to cause a hemorrhage to the early embryo would cause a deformity. Disease of the parent such as myxedema, severe nephritis, infectious diseases as typhoid and certain poisons may cause developmental deformities. In the majority of cases death and abortion results. Psychic causes are questionable.

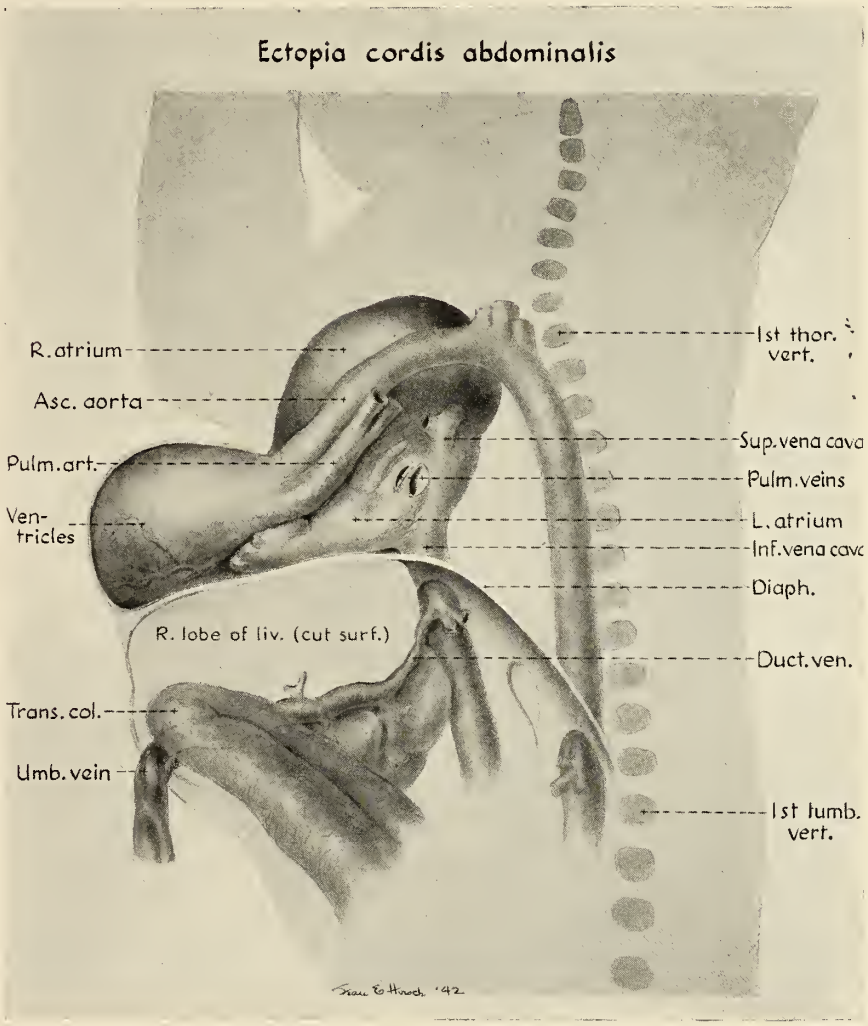


Fig. 10. Ectopia cordis abdominalis.

Very early the amnion lies in contact with the embryo while separation from it takes place later by the formation of amniotic fluid. This liquor amnii may be deficient, may be present in normal amount, or in excess as in hydramnios. If deficient, as the embryo develops and thereby causes a separation of the amnion from itself there remain agglutinations of the surfaces, and as growth continues the embryo finds itself entwined in a mesh of amniotic adhesions, to which may be attributed such developmental deficiencies as are found about the head and in the limbs as amputations. These bands are called Simonart's ligaments. These bands are simple epithelial adhesions or agglutinations and are not inflammatory. In one case of ectopia cordis amniotic bands could be demonstrated on the ventricle as if they had been a causative factor.

Some malformations such as achrondroplasia, albinism or hemophilia, are due to inherited tendencies either dominant or recessive.

In attempting to explain another cause why

anomalies occur, some speculative hypotheses will be expressed, which, though logical, have not been entirely accepted. Such terms as malformation, errors in development, arrested development and transposition have been used in the literature to express the cause of anomalies. Such terms have the faculty of putting a finale on scientific thought as to what forces were active or wanting in bringing about a maldevelopment as contrasted to the normal. When a flower is in full bloom or a large ear of corn hangs on a stalk we admire the beauty of such growth but genetically we must admit that there must have been multiple and varied forces at work to develop such color and fragrance and beauty in the flower and a certain process of chemistry in the carbohydrate development of the corn to produce a fullness of formation in every kernel. Compare this to imperfections in flower development or imperfect kernels or partially developed kernels in the corn, and it is conceivable that some forces were lacking and this can be found in the chromosome and gene structure. Translocations take place in the chromosomes and mutations in the genes, to bring about irregularities in the structure which the chromosome is prepared to build when in normal alignment. So we find a kernel in the ear of corn might have a properly fertilized ovum but something went wrong in the fertilization of the endosperm.

Studies have been made for years in the drosophila melanogaster, the common fruit fly. In-

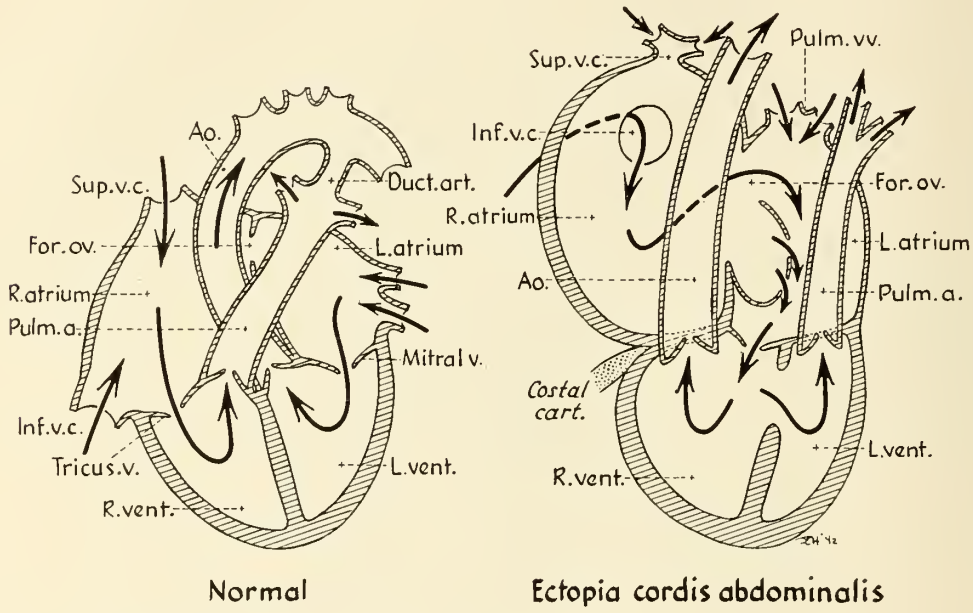


Fig. 11. Line drawings showing circulation in normal conditions and in ectopia cordis abdominalis.

asmuch as the fruit fly produces twelve generations in a year, x-ray and radium effects can be so easily studied and the changes observed. The salivary gland of the maggot of the fruit fly lends itself so readily to such studies. Here we find a definite translocated part of one chromosome attaching itself to another chromosome, and in so doing distorting the development of that portion of the fly structure which such fragment of chromosome was assigned to. Such a translocation can be seen in the photomicrograph (Fig. 6) where a fragment of chromosome number three has attached itself to the x chromosome and there will be an anomaly in the fly, probably lethal. The human being does not lend itself so readily to research and laboratory studies, since a student in genetics would have to live a long life to study the anomaly in two generations. Although there are only four pairs of chromosomes in the drosophila, there are five hundred pairs of factors known.

It seems reasonable to suppose that as vitamins are the exogenous hormones, and the hormones of the endocrine glands control the mechanism

of the developed body, it follows then that the hormones of the intracellular genes control the mechanism of development.[2]

We have learned in the past twenty years of the great potentiality of insulin, a polypeptid which is easily digested. Because the chemistry of insulin of fish, dog and man are identical, allergy is no problem. But we know that if we have an excess of insulin or a deficiency, the mechanism of the body is badly disturbed. Hyalinization of the islands of Langerhans may be the answer, or a tumor may be present.

Thyroxine has a definite force, regulating the oxygen requirement in the body mechanism. An imbalance can take place. An underdeveloped gland may exert an insufficient force to provide the body with enough oxygen, while a pathologic condition might provide a great excess of oxygen to the body. In a similar manner an imbalance of other endocrine glands like the suprarenals, the pituitary, the testicle, the ovary and the parathyroids may act as a misdirected force and may be lethal.

In a very similar way the genes, which are placed in a linear position on the framework of the chromosome, exert a dynamic force and reproduce their kind. Chemically, the transverse striations, seen on the salivary gland chromosome of the drosophila are nucleoproteids. Whether these microscopically visible bodies are the genes, no geneticist will venture to say, but they will admit that these bodies of nucleoproteids are the loci of the genes. Whether the force exerted is a purely chemical one or whether there is an electric influence, or whether there is a combination of these forces, no writer in genetics will mention.

This force may have a normal exercise and a normal being, without a visible defect, will be developed. This means that all the component genes have functioned without failure and every portion of the developed organism is normal.

The force may be dynamic but misapplied or misdirected and an ectopic heart or an anomalus heart structure may develop because of mutation of genes or translocation of a portion of one chromosome upon another chromosome. In our case this was lethal. The force may be deficient or wanting and a hair lip or cleft palate or extrophy of the bladder appear in the newborn infant.

Chemistry and physics have long ago gone through their trial years and are now well accepted in their field. The next science to take its bow to the world is genetics. It already has made big strides and has proven its dignity in the lineup of the sciences.

References

1. Birnbaum, R.: Malformations of the Fœtus (Translated by J. Blacker). Philadelphia: J. Blakiston Son and Co., 1912.
2. Grollman, Arthur: Essentials of Endocrinology. Philadelphia: Lippincott, 1941.
3. Prentiss, Charles W., and Arey, L. B.: Textbook of Embryology. Philadelphia and London: W. B. Saunders Co., 1920.
4. Heisler, John Clement: Textbook of Embryology. Philadelphia and London: W. B. Saunders Co., 1907.

AMERICAN ATABRINE PROVES IDENTICAL TO FOREIGN DRUG

Controversy over whether atabrine, the antimalarial just made official in this country, is identical and equal to the original product developed in Germany, has now been settled in favor of America's chemists.

A report issued by the National Research Council establishes the fact that the drug manufactured in this country is comparable in every respect with that produced in other countries, according to the *Journal of the American Medical Association* (November 14).

Atabrine, chemically known as quinacrine, is now in mass production as a substitute for war-scarce quinine using the process developed abroad. But chemists here have also found their way through the intricate steps of chemical synthesis which produce the bright yellow crystals used to combat malarial fever.

Unpleasant side-actions sometimes accompanying the administration of the drug led to the suspicion that there might be defects in the manufacturing process or impurities present. Doubts have been dispelled by investigations in leading institutions throughout the country which indicate that these minor difficulties are inherent in the atabrine itself, as occurs in many standard medicines.—*Science News Letter,* November 28, 1942.

CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL

A. J. Hertzog, M.D., and S. V. Lofsness, M.D.
Pathologists

Presentation of a Case

Dr. Heise: The case is that of a colored woman, forty-seven years old, who entered the Minneapolis General Hospital on October 26, 1942, and expired two days later. She was first seen in this hospital in the surgery department in 1937 because of a lower abdominal mass. A myomatous uterus, a dermoid cyst of the right ovary and the appendix were removed. She had an uneventful convalescence and was discharged after three weeks. She remained in good health until October 25, 1942, when she developed severe pain in the lower abdomen. The pain started rather suddenly, was crampy but persistent, and was present throughout the lower abdomen. She vomited about eight times during the next twenty-four hours, became weak and somewhat confused, and was then brought to the hospital and admitted.

Her temperature on admission was 100.6 degrees, her pulse rate 120, respiratory rate 20 and blood pressure 126/92. She complained of severe abdominal pain, her skin and mouth were dry, she was somewhat confused and appeared very ill. Examination of the head and chest was essentially negative. Her abdomen was diffusely tender and a vague, very tender mass about 10 cm. in diameter was palpable just to the right of the umbilicus. Pelvic examination revealed a green discharge from the cervical stump and moderate diffuse tenderness in the adnexal regions. Her hemoglobin was 102 per cent, her white blood count was 9,500 with 87 per cent neutrophiles, and her B.U.N. was 20 mg. per cent. A urinalysis and Kahn were negative. Smears of the cervical discharge were negative for gonococci. A duodenal suction tube was passed through the nose and she was given intravenous fluids. Shortly after admission a peritoneal puncture was done and a small amount of fluid containing numerous neutrophiles was obtained. An x-ray of the abdomen was essentially negative. She was treated conservatively but her condition rapidly became poorer. The abdominal pain and mass persisted. Her temperature was 102 degrees the next day and rose to 107 degrees before she died on October 28, 1942.

Dr. Hertzog: This woman entered the hospital with signs and symptoms of acute inflammation within the abdomen. We know that she had her appendix removed five years ago, and this is rather late for any complications except those due to adhesions. A peritoneal puncture supported the clinical impression of peritonitis. A vague tender mass was palpable in the mid-abdomen and an abdominal x-ray was negative for free gas. Dr. Peppard, do you have any suggestions?

Dr. Peppard: There are several things to consider, and the first thing that comes to mind is some type of bowel obstruction with progression to peritonitis. The sudden onset, the fact that she has had abdominal surgery, which is often followed by adhesions, and the recent tender mass all lend support to this possibility. Another thing to consider is primary pneumococcic peritonitis. In years past we saw a number of cases of this disease but recently it has been more uncommon. However, it would be difficult to explain the mass on this basis. The other intra-abdominal accidents such as acute pancreatitis, acute cholecystitis and perforated peptic ulcer must be considered. However, about 75 per cent of patients with perforated ulcer show free gas on x-ray within a few hours.

Student: Does the lapse of five years since her operation lessen the likelihood of obstruction due to adhesions?

Dr. Peppard: Not very much. Obstruction from an adhesive band can follow surgery by many years. What did the mass feel like?

Dr. Heise: It was about 10 cm. in diameter, very tender, moderately firm, and it was not fixed.

Dr. Hertzog: What did the surgeons think about this mass?

Dr. Heise: They thought it might be a carcinoma wth perforation.

STUDENT: Why wasn't she operated upon?

DR. HEISE: Because of her poor condition on admission, she was treated conservatively.

DR. HERTZOG: Dr. Heise will now describe the findings of the autopsy and you will note that they are rather unusual.

DR. HEISE: The only significant changes were in the abdominal cavity, except for slight bronchopneumonia in the lower lobe of the right lung. The peritoneum was moderately congested and lustreless, and there was approximately 500 c.c. of purulent, foul-smelling fluid in the peritoneal cavity. Several loops of small bowel were matted together in the mid-abdomen. They were covered by a yellow fibrinous exudate and the slightest disturbance caused pus to exude between them. After separating the loops of bowel, approximately 50 c.c. of pus escaped. The most discolored segment of bowel was in the upper jejunum about 50 cm. beyond the duodenum. In this region there was a diverticulum protruding into the mesentery; it was 4 cm. long, 2 cm. wide and its opening into the jejunum was 8 mm. in diameter. There were two pieces of firm stool in the proximal portion of the diverticulum. The wall of the diverticulum was thin, discolored, friable and covered with pus, but no gross perforation was seen. The intestine was sharply angulated at the diverticulum and above this it was moderately distended. There was a similar but smaller diverticulum 15 cm. further down the bowel but it showed no inflammation. The other organs were essentially normal.

DR. PEPPARD: Diverticula are uncommon in the upper portion of the small bowel, and diverticulitis more so. This explains the mass and the obstruction. We frequently see duodenal diverticula but they seldom cause any trouble. Is the diverticulum in this case comparable to them?

DR. HERTZOG: Dr. Lofsness will discuss this question for us.

DR. LOFSNESS: There are certain regions in the intestine where diverticula are most common, and these are the sigmoid colon, the duodenum and the terminal ileum. In the sigmoid colon, diverticula are seen in approximately 5 per cent of people. They are small and multiple. Usually they are eight to ten millimeters in diameter, have narrow opening into the bowel, and often protrude into the appendices epiploicæ. They seldom extend down into the rectum but occasionally are present in the descending colon. They are most common in older people and seem to be associated with constipation. Recently we had a patient with signs and symptoms of appendicitis, but operation revealed small diverticula of the cecum with acute inflammation; this, however, is quite unusual. In the sigmoid colon, diverticula give no trouble in at least 80 to 90 per cent of people. They sometimes show chronic inflammation with diffuse thickening of the wall and resulting stenosis and obstruction. This lesion is not infrequently misinterpreted as carcinoma. Acute sigmoid diverticulitis is less common. The process is usually sealed off, with local abscess formation and occasional perforation into the bladder.

Meckel's diverticulum occurs in the lower ileum, usually 50 to 100 cm. above the cecum. They are usually less than 10 cm. long and are located on the antimesenteric surface. They are found in one to two per cent of people and are due to persistence of part of the fetal yolk stalk. They sometimes are the site of acute inflammation and simulate appendicitis. Occasionally the mucosa is in part of gastric type with acid formation, and rarely a peptic ulcer forms.

Other diverticula of the small bowel occur into the mesentery. This is probably because the wall is weaker due to the penetration of the blood vessels, and the lack of a peritoneal covering. Our case falls into this group. There are usually only one or a few diverticula, but in some cases dozens are found. They are not unusual at autopsy but rarely cause any trouble.

Diverticula of the duodenum are common, but complications are rare here also, probably because of their relatively wide openings. In the first portion they are usually due to peptic ulcer with healing and scar formation. In the second portion they are apparently congenital, and are often located near the papilla major.

The pathogenesis of this case, and perhaps most cases of diverticulitis, is comparable to that of appendicitis. There is a blind pouch lined by secreting epithelium which becomes obstructed by a fecolith. The accumulating fluid distends the diverticulum, and this pressure reduces the blood flow through the wall, lowering local resistance to the ever-present bacteria.

DR. HERTZOG: We have presented a case of peritonitis of quite unusual etiology. The final anatomical diagnoses are: (1) Acute jejunal diverticulitis; (2) Generalized peritonitis; (3) Bronchopneumonia.

Peanut oil, now being used for cooking and salad oil, is used industrially in shaving lotions, cosmetics, soaps, dyes and axle grease; and medically, among other uses, in massage for infantile paralysis victims.

THE ASIATIC CHOLERA IN SAINT PAUL

JOHN M. ARMSTRONG, M.D.
Saint Paul, Minnesota

(Continued from January Issue)

Now for the cholera—most of the few cases here occurred before the station was ready for use and are unrecorded. On August 14 (a Thursday), the steamer *Canada* arrived from down the river with two sick men aboard, who the clerk reported were just suffering from cholera-morbus, although five had died on the deck on the Sunday previous. The clerk said the men had eaten a large quantity of green apples and buttermilk which had made them ill. The two sick men were removed to some place, now unknown, and the clerk enlightened. Both men recovered. On August 24, the day the Quarantine Station was opened, a Norwegian immigrant named Paul Andreas Anderson, aged sixty years, was taken from a steamboat at the station and died in six hours. Doctor Smith told me he found this man in a moribund condition lying on the lower deck in a pile of filth, having lost about half his weight. No one would go near the man so he himself carried him to the building. The man was hastily buried on the river bank near the station. Shortly after this, two men were taken from a raft on the river to the station, one of them named Williams. They recovered. These were apparently the last patients treated at the station. I can ascertain the case of but one other who had the cholera during this epidemic, a man named Callihan who died September 9 in town. He is the last recorded cholera patient in Saint Paul, although the late Dr. Samuel D. Flagg told me he saw a cholera patient in 1873, and Doctor Stewart agreed with him as to the diagnosis. The Quarantine Station was closed September 19 and cost the city in all about $3,770. Sometime later, when employes of the city went down to remove some of the furniture, it had disappeared. Some few small articles were recovered from two Frenchmen down the river, but the rest were not found and apparently the search for them was not finished. It was apparent that some one knew where they had gone. The next spring a body was found in the river below Pig's Eye. Doctor Smith, as deputy coroner, recognized the body as that of Anderson and again certified as to the cause of death. The high water had washed away his grave. The last instances of cholera in Minnesota occurred in 1873, eleven cases with eight deaths in a Norwegian immigrant family near Willmar.

While this was the end of the Asiatic cholera in Minnesota, it does not quite end the story, as twice since then the subject has been discussed in meetings of the Ramsey County Medical Society. At the meeting of November 24, 1884, C. D. O'Brien appeared before the Society stating his object in coming to the meeting was to get the sentiment of the Society in regard to the danger to be apprehended from a cholera outbreak in the city next summr. He then proceeded to read a communication to the City Council from the health officer, Dr.

H. F. Hoyt, on the sanitary condition of the city and asked what might be done to improve conditions. Mr. O'Brien said he conceived it to be his duty as the executive of the city of Saint Paul to see that everything possible was done in order to protect the people from possible danger. After some discussion, Mayor O'Brien said in order to simplify matters, he would propose three questions to be solved by the Medical Society. First: Is there reasonable apprehension of the cholera coming to the United States and to Saint Paul next summer? Second: What is the present condition of the city as regards sanitation? Third: What is necessary to be done in order to prevent an epidemic here next summer? Dr. A. J. Stone then moved that a committee of two physicians from each ward of the city be appointed to answer the Mayor's questions. Those appointed were:

First Ward.....Dr. Murphy and Dr. Hoyt
Second Ward.....Dr. Jones and Dr. Ritchie
Third Ward.....Dr. Hand and Dr. C. E. Smith
Fourth Ward.....Dr. Leasure and Dr. Sloan
Fifth Ward.....Dr. Beal and Dr. Francis

Whether this committee ever reported and what was done is unrecorded in the Society's minutes.

In 1892 a most disastrous cholera epidemic occurred in Hamburg and on September 14, a special meeting of the Ramsey County Medical Society was held to discuss the situation should the disease reach this county and Saint Paul. Dr. Harold Graff opened the discussion. Dr. David Day, a guest of the evening, said:

"I graduated in 1849 and in the five years following saw a good deal of cholera in the hospitals of Philadelphia and elsewhere . . . Each epidemic of cholera is accompanied by a great deal of vague bowel trouble, the so-called cholerine, and it is somewhat difficult to make a diagnosis at first. I learned, however, to recognize the real cholera by the smell, as it resembles very closely the smell of fresh blood. In the epidemic which occurred in this city some years ago (1866), I think there were not more than twenty cases of real cholera . . . I recollect one instance in which it took every member in several families in our elevated rural district . . . The disease is so rapid in its course that there is absolutely no time for hospital treatment."

Dr. J. H. Murphy said:

"I have lived in this state to see two or three epidemics of cholera . . . I do not apprehend that we shall have very much trouble here, even if it should reach this country."

While this discussion was going on, the *Moravia* was steaming towards New York with cholera aboard, but strict quarantine prevented its spread.

BUBONIC PLAGUE IN 1942

A case of bubonic plague in a two-and-one-half year old baby girl in Siskiyou County, California, has been reported to the U. S. Public Health Service. This is the first case of plague in humans in the United States since the summer of 1941, when two fatal cases occurred in the same county.

The child is expected to recover, thanks apparently to treatment with sulfadiazine. The sulfa drug treatment was started following a telephone call to Dr. Karl Meyer, Hooper Foundation, University of California. Presumably it was advised by Dr. Meyer, since he has reported successful sulfa drug treatment of plague in laboratory animals.

Where the little girl picked up the plague germs is not definitely known. Her father had hauled hay from a region where plague-infected ground squirrels were known to exist, and the child was playing in the hay the day before she got sick. Cats, dogs, mice and wood rats in the barn of the child's home are considered other possible sources of infection, since these might have harbored plague-infected fleas.—*Science News Letter,* December 12, 1942.

HISTORY OF MEDICINE IN DODGE COUNTY*

BY JAMES ECKMAN†
Rochester, Minnesota
and
CHARLES E. BIGELOW, M.D.
Dodge Center, Minnesota

The pioneer physicians were in very truth a virile and faithful lot of men of whom it would be difficult to say too much in praise. They all looked upon their calling as a profession and not a business and were ever more solicitous about the welfare of their patients than they were about the size of their pocketbooks. The art or science of medicine (whichever it may be) has advanced with rapid stride in the last fifty years and the physicians of today are much better informed, and for that reason more efficient, than the physicians and surgeons of earlier days; but with all of their advantages I very much doubt if they are as unselfishly devoted to duty as their predecessors.—SAMUEL LORD, *Recollections of Mantorville*[1] (1919).

THE celebrated John Charles Frémont (1813-1890), "Pathmaker of the West"[2] and first Republican candidate for the presidency, in company with Henry Hastings Sibley (1811-1891) and several others, penetrated to what is now Mantorville in Dodge County in 1838 or 1839.[3]‡ In a dense wood nearby General Sibley shot a large stag: "It being the first capture of elk that had been made by the party, I was naturally somewhat elated at my success."[3] In the course of investigation of the history of medicine in Dodge County, it is interesting to discover that Frémont, then an unknown young man of about twenty-five years, was "in feeble health."[3] The army surgeon at Fort Snelling had advised him to accompany General Sibley on a hunting trip to Iowa as a therapeutic measure, and Sibley was able to report that "Frémont continued to improve daily from the start, and during the prolonged trip he acquired that robustness of constitution which enabled him to endure the exposures and privations to which he was exposed not many years afterward."[3]

Frémont then proceeded eastward to Prairie du Chien to rejoin the well-known French physicist, Joseph Charles Nicollet (1786-1843), one-time associate of Pierre Simon Laplace (1749-1827), and Dominique F. J. Anago (1786-1853), who awaited the youthful huntsman anxiously.[3]

According to Professor Nevins,[2] Frémont never forgot the beauty of Southern Minnesota as he found it in the late thirties of the preceding century:

Forever afterward, Frémont remembered the rare beauty of the prairies as the gradual northern autumn came on, turning the aspen leaves to gold and the cottonwoods to silver, and brightening the far-spreading plain with clumps of sere buffalo grass and vari-colored flowers. The lowlands near the Renville post were sprinkled with purple asters and ablaze with goldenrod, for that year the prairie flowers were exceptionally luxuriant. On clear days the azure sky merged imperceptibly with the remote horizon, and distant objects trembled and loomed till their size could hardly be judged; in the warmth of Indian Summer smoke veiled the far-off swells, and gossamer drove before the breeze.

This probably is a valid description of what is now Southern Minnesota (not specifically the region embraced in Dodge County**) as the first settlers beheld it.

---

*From the History of Science Seminar (Eckman) of Richard E. Scammon, Ph.D., LL.D., Graduate School, University of Minnesota, Minneapolis.

†Division of Publications, the Mayo Clinic.

‡Sibley himself (reference 3) said the year was 1840, but in 1840 Frémont was not in the West. Professor Nevins (reference 2, p. 36, footnote) has written that the year 1838, which Fremont used in his *Memoirs*, should be accepted as the true one, although he noted that the year may have been 1839.

**Without doubt the region now included in Dodge County was well known to Dr. Lafayette Houghton Bunnell (1824-1903) of Winona, Minnesota, who among other exploits discovered the Yosemite Valley of California in March of 1851. For a complete life of this man, see: Kelly, H. A.: Lafayette Houghton Bunnell, M.D., Discoverer of the Yosemite, Ann. Med. Hist., 3:179-193 (summer) 1921.

The Pioneer Era, 1854-1860

The first railway train to turn a wheel in Minnesota was pulled by the diminutive locomotive *William Crooks* from Saint Paul to Saint Anthony in the summer of 1862;[4] the first enduring impress of civilization recorded in what is now Dodge County was made on April 14, 1854,* when "a company of homeseekers arrived at the present site of Mantorville; on the 15th they proceeded as far as Concord and camped for the night."[5] The next day they erected a house at what is now Concord. It was the first habitation in the county.

How then did these people reach the inland fastness of the region now comprising Dodge County? Probably, at Rochester, they took a crude trail westward over the plains from the old stagecoach road which was opened in the early part of 1854 and which ran northward from Dubuque to the Iowa boundary and thence through Carimona,† Chatfield, Rochester, Zumbrota, Cannon Falls and Hastings.[6] As a writer in the *Minnesota Democrat* is said[6] to have observed in 1852: "The best route is from Dubuque north to the Iowa line, and thence into the Blue Earth and Cannon Valleys."

It has been shown[6] that an early Minnesota physician, **Dr. William W. Finch,** was a commissioner who surveyed a territorial road which was laid out to follow the old traders' trail to Faribault's post and the Straight and Cedar Rivers to the Iowa line. Armstrong has shown that Doctor Finch was in practice in Saint Paul before November of 1853,[7] that he was elected treasurer of Steele County in 1861,[8] and that he died in Santa Barbara, California.[8] Not much more is known about him.

The first settlers in Dodge County no doubt traversed the aforementioned stagecoach road from Dubuque, instead of going up the Mississippi River as far as Winona and then striking off westward overland, for there was no road from Winona to Rochester until 1855,[6] although there seems to have been one from Red Wing through Oronoco** and thus into the county. Rochester, in fact, was platted as a town and marked off as a stagecoach station on the same day: July 25, 1854;[6] but the stagecoach road in question was the one, previously referred to, which ran northward from Dubuque.

Larsen,[6] in an admirable study of the region which included Dodge County in the period of its settlement, wrote:

> To the south of those settlements (Saint Paul, Saint Anthony, Fort Snelling, Mendota, Stillwater) was a dense wilderness comprised within a triangle of land bounded by Iowa on the south, the Mississippi on the north and east, and the Minnesota and Blue Earth rivers on the north and west. Since immigrants arriving in Minnesota came first to this Triangle, it naturally was settled early in the territorial period. There was scarcely a trace of human habitation in the interior of the Triangle at the beginning of the fifties. Seminomadic Indians roamed over the region. At the junction of the Straight and Cannon rivers, in what became Rice County, a trader named Alexander Faribault had established a trading post in 1826, and there were temporary posts in other parts of the interior; but with these exceptions the wilderness was unbroken.

---

*Some of the men in the fall of 1853 had in fact penetrated to where Mantorville now stands, but they shortly returned to their homes in either Iowa or Pennsylvania (probably the former state) for the winter, settling permanently in Dodge County on the date named above.

†The Carimona House in what is now Fillmore County was a famous stagecoach inn of the period. Its register is now owned by the Minnesota Historical Society. See reference No. 10.

**Equipment for the *Mantorville Express* was brought by ox team into Dodge County by this route in 1857. At the ford on the Zumbro River near Oronoco some of the equipment fell into the river, thereby "'wetting down' the paper for the first edition." See: History of Winona, Olmsted, and Dodge Counties, together with Biographical Matter, Statistics, Etc., Chicago, H. H. Hill & Co., 1884, p. 1246.

(To be continued in the March issue.)

All references will appear at the end of the completed chapter.

President's Letter

TANGIBLE RESULTS

TIME was, within the memory of many of our older members, when practically the the only source of public information on matters relating to health was found in books like "Dr. Gunn's New Family Physician or Home Book of Health." Built on the generous lines of the family Bible, with gold embossed letters on the back, and a title page setting forth that the book "gives many valuable suggestions for avoiding disease and prolonging life, with plain directions in case of emergency, and pointing out in familiar language the causes, symptoms, treatment and cure of diseases incident to Men, Women and Children, with supplementary treatises on Anatomy, Physiology and Hygiene, and on Domestic and Sanitary Economy," these books were sold by "book agents" who went from house to house. A perusal of these books, even at the present day, discovers much useful and valuable advice, some philosophical in nature, some practical, and it is no part of my purpose to scoff at such books of instruction and guidance. They served a useful purpose in a period when medicine was regarded as something abstract and abstruse, the knowledge of which should be restricted to a select few, and which was shrouded in a certain mystery. This mystery was deepened by illegible prescriptions written in bad Latin, calling for bizarre and exotic drugs. The homely advice and common sense found in such books constituted a large part of the "public health education" of those days, and probably fairly represented the accepted medical practice of the period.

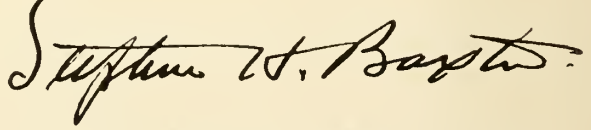
The mystery surrounding medical knowledge and the idea that only graduates in medicine should possess it, held back for many years any systematic or consistent efforts by competent, ethical physicians to educate the public in matters relating to sickness and health. All this is now changed, and private physicians, with the consent and approval of ethical medical organizations, may give popular lectures to all kinds of lay groups on a wide variety of medical subjects. Every avenue by which the public can be reached is now utilized for disseminating medical knowledge, and organized medicine has taken its full share of this task. Window displays have been prepared and distributed, spreading knowledge of cancer, tuberculosis, vaccination and immunization and nutrition. Pamphlets by the thousands have been distributed through doctors' offices giving information on nutrition.

Two radio programs are worthy of notice. Dr. O'Brien's programs combine scientific authenticity and accuracy with a clearness and skill in presentation that make them outstanding in the field of educational programs. Another radio program that deserves notice is called "World Health News," which is sponsored by the Hennepin County Tuberculosis Association. Since April, 1940, this program has given a weekly digest of articles pertaining to health which have appeared in various authoritative medical and scientific publications. The newspapers have done their share in the dissemination of medical knowledge.

Does all this effort pay in the form of tangible results?

A few weeks ago a healthy-appearing young man, twenty years of age, came to a doctor's office asking for a Wassermann test of his blood. Inquiry failed to elicit any history suggestive of syphilis, but the laboratory reported that the blood serum gave a positive reaction. This was confirmed by an independent report from another laboratory. Closer questioning brought out the history of a probable syphilitic infection about three years previously, all signs of which had disappeared spontaneously in a few weeks. Some information which this young man had received recently as a result of the campaign of public health education had recalled to his mind the incidents of three years ago and the result is that he is now taking a course of treatment with a good prospect of being cured.

This, of course, is no isolated case, but merely an example of what is doubtless happening every day in doctors' offices and in homes all over the country. Yes, all our efforts to educate the public to pay; we see fewer neglected, hopeless cases of cancer of the breast; mothers are learning not to give castor oil for the child's "stomach ache;" parents are anxious to have their children vaccinated and tuberculin-tested. The value of some kinds of advertising is difficult to determine, but public health education brings tangible results of great value to the individual and to the community and emphasizes the fact that the medical profession recognizes and is ready to assume its responsibility for the health of the people.



President, Minnesota State Medical Association

Editorial

Carl B. Drake, M.D., *Editor;* George Earl, M.D., Henry L. Ulrich, M.D., *Associate Editors*

WAR AND DISEASE

DISEASE and pestilence associated with war have caused a greater toll of human life in all wars recorded in history than the conflict itself, with the possible exception of the Russo-Japanese war at the turn of the century. In most wars more of the armed forces have died from disease than from combat and if we include the loss of life in civilian population from pestilence spread by troops or incident to war, the grand total of loss of life from disease greatly exceeds that due to conflict alone.

What can we expect in regard to the factor of disease among our troops in the present world-wide conflict? Our troops are already in every quarter of the globe.

It is true that medical science has made great progress in the discovery of the cause of many diseases which will be encountered by our troops and personnel, their mode of transmission, means of preventing that transmission and specific remedies in a few instances. In the main, however, we shall have to rely on the prevention of infection rather than curative methods. And in war, preventive methods applicable to peace time obviously cannot be carried out.

Universal vaccination against typhoid, smallpox and tetanus is being used for all our troops. Those being sent to the tropics are receiving additional vaccination against yellow fever, typhus and cholera. Troops are being sent to regions where they will encounter malaria plague, amebic and bacillary dysentery, kala-azar, dengue fever, sandfly fever and helminthic infections, against which no vaccinations are available and general sanitary measures constitute the only defense.

Malaria fever constitutes a serious problem. Endemic in the tropics, mosquito control is impossible. Fortunately, the army was well stocked with quinine in advance. While the routine administration of quinine and the equally efficacious atabrine holds malaria symptoms in abeyance, it does not prevent infection and no doubt many troops will return infected with malaria. The anopheles mosquito, the vector of the disease, is widespread in its distribution in this country, including Minnesota, and all we need is a few infected individuals to cause more or less of an epidemic in this state.

Bubonic plague should not prove a serious problem. We know it is spread by the rat flea and rigid measures against the landing of rats at our ports should prevent invasion of our country. We know, however, that there is a focus of the disease amongst the rodents in California which constitutes a constant threat to citizens in that state.

The control of amebic and bacillary dysentry lies in the protection of water and food, an impossibility in certain campaigns.

Fortunately, dengue and sandfly fever, although major causes of disease in some areas, are seldom fatal.

Yellow fever is endemic in South America. The *Aedes Aegypti* mosquito, which is the vector of the disease, is present, however, in the southern states and a few cases could conceivably start an epidemic. The prevention of importation of infected mosquitoes by airplanes arriving from South America is important. Vaccination has been accepted as effective, although certain batches of vaccine produced jaundice weeks to months after administration, with considerable disability, and even a mortality of 0.2 per cent of hospitalized cases. While the cause of the severe reactions has not been completely determined, the elimination of human serum in the preparation of the vaccine seems to have eliminated the reactions. Only troops going to South America and central regions of Africa are inoculated.

Typhus fever can be prevented largely by controlling infestation with the body louse. The disease at present is in evidence on the Russian front and in northern Africa where last year severe epidemics occurred from Morocco to Egypt. The effectiveness of inoculation has yet to be confirmed. We have had small epidemics of typhus fever in this country. Several years ago a number of cases of Brill's disease

appeared in New York City which proved to be typhus. As recent as 1939 one hundred cases of typhus developed in localized areas of Nashville, Tennessee. It seems that endemic typhus is spread by the rat flea and the extermination of rats in certain areas of Nashville terminated the small epidemic.

Cholera resembles typhoid fever in its symptoms and mode of spread. Epidemic invasion of this country by the disease should be easily prevented because of the short incubation time of one to three days and the long period of travel necessary from the Far East to our shores.

Medical science will do more in the present conflict to prevent disease and wounds from exacting as great a toll amongst our armed forces as in previous wars. The sulfo dyes are a valuable addition in the treatment of war wounds. The availability of blood plasma in large amounts for blood replacement is also new and most valuable. We are fortunate in having an enlightened and efficient Medical Corps augumented by more than 40,000 of our best civilian surgeons and medical men who will do much to mitigate the ravages of war and disease.

DOCTOR, SAVE OUR MILEAGE!

CIVILIAN travel by automobile is absolutely essential to the war effort. Seven out of ten industrial workers have to ride to work by private car. Streetcars, trains, and busses can't carry them. The public means of transportation are already overcrowded, and still three-fourths of all travel is by privately-owned automobiles.

So it isn't a question of automobiles or some other form of transportation. For most of us it is a question of automobiles or no transportation at all.

Mileage is being rationed—not because we haven't plenty of gasoline—but because our rubber situation is so extremely critical that drastic measures are necessary to conserve every precious ounce of rubber and every existing tire in the country.

The mileage that remains in our cars and in our tires is essential transportation. To win the war, the country needs this mileage just as it needs steel and aluminum, or planes and ships.

Need the doctor with his "C" book be concerned with mileage rationing? Isn't he in a privileged class so far as gasoline and tires are concerned?

In recognition of the importance from the community standpoint of the doctor's being able to make necessary professional calls, he is made eligible for "preferred mileage" for that purpose and for that purpose only. The law says "for making necessary professional calls outside of his office if he regularly makes such calls and for travel between offices maintained by him."

A doctor is not automatically entitled to a "C" book. The type of ration coupon book he receives depends primarily on the mileage he actually needs for making necessary professional calls. Some doctors will need less than others. The professional needs of some doctors can be taken care of within the occupational mileage of 470 miles per month afforded by a "B" book. Whether the doctor's car carries a "B" sticker or a "C" sticker, he is allowed only 90 miles of personal and family driving per month, because anyone receiving either a "B" or a "C" book and sticker is expected to use 150 of the 240 miles of driving a month on his "A" book for occupational purposes. And if there is a second car in the family not being used principally for someone else's occupational driving, the doctor is expected to use that to the extent of 150 miles per month with its "A" book.

Except for the "preferred mileage" allowed for the making of necessary professional calls, the doctor has no greater driving privileges than his layman neighbor—and properly so.

There is a notion, more widespread among layman than among doctors, that a "C" sticker on the windshield of a doctor's car means unlimited personal driving not only for the doctor but for all other members of the doctor's family. It is regrettable if any doctors, unintentionally or otherwise, have overstated their actual mileage needs for making necessary professional calls and permitted the use of their cars to lend credence to any such notion. Such practices will only reflect against the integrity of the individual doctor and the standing of the profession.

Tires are what the new mileage rationing program is designed to conserve. With the available supply of new regular tires being rapidly diminished, the emphasis is laid on the care and preservation of our present tires, on the prolonging of their useful lives through reduction in speed, periodic inspections, and timely recap-

ping as needed. Where, through no fault of the car owner a tire must be replaced, the type of replacement tire allowed for the particular car depends upon the mileage which has been allotted. The holder of an "A" book only or the holder of an "A" and a "B" book may be eligible for a so-called Grade III tire, which is either a used tire, a recapped tire, or a War tire made of reclaimed rubber. The "C" book holder, when eligible for a replacement tire, may receive a new Grade II or Grade I "pre-war" tire depending on whether his allowed mileage is more or less than 1,000 miles per month.

Applications for tires or recapping services are made with the Local War Price and Rationing Boards. These Boards receive very limited monthly quotas of tires which they cannot exceed, so eligibility for a replacement tire in no way gives any assurance that a tire may be received. This is an additional reason for taking the very best care of one's present tires.

We are assured that every effort will be made to provide doctors with tires needed for making necessary professional calls. Because of the war emergency, no better grade tire and no more rubber can be provided than is absolutely needed for essential travel.

Transportation is a vital war commodity. Doctors can and will do their part in eliminating nonessential mileage.

HUGH W. BROOKS
Office of Price Administration
State Rationing Attorney

WITH CLUBS IT'S LEGAL

A farmer or other producer hauling his produce into New York City must stop at the city line to take on and pay a member of the local teamsters' union. Truck owners who have resisted paying this tribute have suffered damage to their vehicles and the destruction of their cargoes. The Supreme Court of the United States recently ruled that so far as federal statutes went these union activities were perfectly legal and the federal Government could not interfere with them. The consumers of New York pay this union tribute in higher prices.

Organized physicians in the city of Washington, D. C., conspired to interfere with the operations of a coöperative organization to give cheap medical attention and hospitalization to its members who were Government employes. The physicians were charged with attempting to prevent the members of their association from accepting employment under the group health plan and to restrain hospitals from affording facilities to patients of physicians employed under the group plan. The Supreme Court ruled that the organized physicians violated the Sherman anti-trust act.

We do not raise the question as to whether the court correctly interpreted the law in each case.

Apparently the Washington physicians went about this thing in the wrong way. They should have organized a union. The union officials would then hire a group of plug-uglies. These goons could then have beaten up the physicians who did not conform to union rules. They could have picketed the hospitals and refused to let supplies be taken to them.

In all of these activities they would have been immune from federal prosecution. Of course, the local police might have become inquisitive but who in recent years has heard of local police daring to interfere with the activities of union picket lines? What reason is there to believe that Washington, where unions have such powerful friends, would be an exception?

Well, at any rate the good doctors of Washington now know who constitute the "underprivileged."—*Wall Street Journal,* December 20, 1942.

THE TAX ON NON-GIVING

Every minister and every church finance committee should understand the interrelation of taxes and giving.

The important fact is that (up to 15 per cent of his taxable income) the American citizen's gifts represent an *untaxed* part of his income, 100 per cent at his own disposal. It is a long-accepted principle of income taxation that the impulse to give to social and religious purposes should not be penalized by taxation.

Under the new high tax schedules this is more important than ever before. A part of every dollar given to religious, charitable, educational and similar institutions is money which would otherwise go to the Collector of Internal Revenue, the part varying from 24 per cent on an $800 net income or 31 per cent on a $5,000 net income, to 51 per cent on a $15,000 income and 88 per cent on a $100,000 income.

Put in another way, it may be said that the government contributes a part of every dollar disbursed as such gifts. To illustrate: Mr. X, having a net income of $2,000, considers a $100 gift to the church; decides against it; keeps the $100. The tax collector, however, takes $24.00 of the $100. Mr. X retains the balance, but it is then clear to him that if he had made the gift, $24 of it would in effect have been absorbed by the Treasury.

Even more striking is the fact that in the same way a corporation subject to excess profits tax makes a contribution of $1,000 at a net cost to itself of only $190, the balance of $810 being the sum which would otherwise be paid in taxes.

We are not emphasizing tax avoidance; we are stressing the fact that the work of the church is supremely important, its financial support essential, and that the government encourages giving by allowing an equivalent deduction from taxable income up to a limit of 15 per cent of net total income. The same principle applies in Canada.

Between now and the year-end, remind your friends that there is a heavy tax on "non-giving"!—*Ministers Life and Casualty Call,* December, 1942.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

PLANNING FOR THE FUTURE OF MEDICINE

POSTWAR planning requires no coupons. It is not a rationed indulgence and statesmen, economists, scientists, editors and philosophers are all busy sketching their own pictures of the world to come. Some of these pictures are obviously in the realm of fantasy. But all assume, as a matter of course, that great changes are inevitable and that they will come about with a speed for which there is no recorded precedent in history.

We are virtually promised a new era in transportation as soon as the treaties are signed—rear-engined automobiles of unimagined performance and private planes which rise vertically into the air from backyard hangars.

Governor Stassen proposes a world parliament and a world police force to keep men at peace and trade lanes open.

"Production for Employment"

President Roosevelt is said, on good authority, to be ready to propose a plan for postwar jobs on a scale that would utterly eclipse WPA in its heydey. The motto will be "production for employment," not production for profit and every industry will be required to hire its allotment of workers regardless of funds to meet the payroll. If profits are lacking the government will step in and buy the goods.

No major prophet in America has so far blueprinted medicine in this world to come. But minor prophets with plans for a new era in medicine are legion. In England, of course, the Beveridge report has already called for vast extensions of health insurance. It envisions government hospitals as health centers of every community after the war.

Will the major planners in America leave medical practice out of their calculations? It seems hardly likely.

True, the new Congress will not be so friendly to social experiment as immediate predecessors. It should be remembered, however, that many a planner in Washington is in a position to give considerable substance to his ideas without benefit of Congress.

Impossible to Ignore

It is true, also, that the end of the war is likely to see a reaction such as followed World War I against war and all of its works. But public reaction will not be able to camouflage the toughest economic problems the world has ever faced. The most reactionary administration it is possible to conceive in Washington will not succeed in ignoring demands for jobs and security from millions of returning soldiers and millions of discharged war workers. Lacking a new continent to develop, some social and economic planning will be forced upon the government in Washington regardless of the complexion of its politics at home. And it is inconceivable that anything so intimately bound up with public welfare as medical service will escape considerable change and adjustment.

Whether qualified physicians or Washington bureaucrats plan these adjustments and put them into effect, depends largely upon the attitudes and policies of physicians themselves, now, as well as later when the crisis is upon them. They too must take a hand in the planning and sit in the counsels of the planners.

Physicians Can Lose

Medical association officials have sometimes appeared in the public eye as mere obstructionists, stubbornly and blindly combating change. It is self-evident that no one wins a battle against time and tide and the forces of social evolution. But by the same token, physicians, their traditions and their standards, can lose and lose trag-

ically if they fail to take a wise and responsible hand in shaping events to come.

For that reason, the program arranged for the 17th National Conference on Medical Services to be held Sunday, February 14, at the Palmer House in Chicago is of the greatest interest and importance.

Medical Participation to be Planned

The program is comprised of two symposiums entitled, respectively, "An Analysis of Current Trends in the Control of Medicine" and "Medicine in the Postwar Era." Medical association officers, delegates and committees from all over the country will engage in these discussions. Out of them should come some realistic and sound policies to guide their participation in the America to come.

Every physician who can possibly spare the time should attend this meeting and take part in these important discussions.

MEDICAL AND HOSPITAL OBSTETRIC AND PEDIATRIC CARE FOR WIVES AND INFANTS OF MEN IN MILITARY SERVICE

Note.—The information printed below was provided by Dr. A. J. Chesley, secretary and executive officer of the Minnesota Department of Health after consultation with the Committee on Child Health and the Council.—The Editors.

The Minnesota Department of Health has a limited fund, in the amount of $10,000, allotted by the United States Children's Bureau under the terms of the Federal Social Security Act, to provide the medical and hospital obstetric and pediatric care needed by the wives and infants of men in the military service. As you will note, only $10,000 is available now and we have no information as to what funds the Children's Bureau may make available in the future. In recognition of the limitations of this fund, it is urged that all claims on it be made with discretion and thoughtfulness. Furthermore, the provisions of this program cannot be made retroactive. Applications will be accepted only for patients currently receiving medical care and until the fund is exhausted.

Eligibility

All expectant mothers living in Minnesota, irrespective of legal residence, who state that the father of the expected child is in military service (U. S. Army or U. S. Navy, including Marine Corps or Coast Guard) and not a commissioned officer, are eligible for financial assistance with medical and hospital obstetric care without cost to the family whenever such care is not available from Army or Navy physicians and hospitals and tax-supported prenatal and pediatric clinics or hospitals. Unmarried expectant mothers will be included in this program in accordance with plans for their care developed by the State Division of Social Welfare and, therefore, the unmarried expectant mother should be referred to the County Welfare Board in the usual manner.

Any child under one year of age living in Minnesota, irrespective of legal residence, whose father is in military service, but not a commissioned officer, is eligible for pediatric medical and hospital care, including well-baby care and care during sickness, without cost to the family whenever such care is not available from Army or Navy physicians and hospitals and tax-supported pediatric clinics or hospitals.

Applications

Applications for these services are to be submitted jointly by the patient and the physician of her choice as soon as possible after care begins.

Three application forms are provided: (1) for medical and/or hospital maternity care; (2) for well-baby medical care; (3) for medical and/or hospital care of child during illness. The last form should be submitted for each individual illness or hospitalization. These forms are obtainable from the Division of Child Welfare, Minnesota Department of Health, University Campus, Minneapolis, and are to be submitted directly to that division.

Authorization

Such applications will be approved for payment when the medical services are to be rendered by Doctors of Medicine licensed in Minnesota by the State Board of Medical Examiners and when hospitalization is to be provided in an institution licensed for the purpose by the Minnesota Department of Health. It is requested that the least expensive available hospital facility be used, i.e., ward beds or semi-private rooms in preference to a private room. Private room care will be authorized for the patient whose condition requires it. Notification that payment is authorized will be sent immediately after approval to

the attending physician, patient, and hospital—if hospital care is recommended by the attending physician. The case will then be referred to the local public health nurse with a request that she contact the attending physician to ascertain whether her services may be of assistance in the care of the patient.

Payments

Payments for medical and hospital care will be made only if previously authorized.

Payments to physicians for medical services will be made by the Division of Child Hygiene, Minnesota Department of Health, at the termination of care and when a satisfactory maternity or pediatric record is submitted on forms supplied for the purpose. These payments will be made in conformity with the fee schedule recommended for use in this program by the Minnesota State Medical Association. The fee schedule is attached herewith.

Payments for hospital obstetric and pediatric care will be made by the Division of Child Hygiene, Minnesota Department of Health, at the per diem rate of the hospital concerned upon receipt of a satisfactory record of services rendered. Forms are supplied for this purpose.

Medical Consultation

Physicians desiring medical consultation in the care of these patients are directed to apply to the County Medical Advisory Committee. The consultant will be paid the fee provided in the attached fee schedule.

MEDICAL FEE SCHEDULE FOR MEDICAL AND HOSPITAL OBSTETRIC AND PEDIATRIC CARE FOR WIVES AND INFANTS OF MEN IN MILITARY SERVICE

From the Schedule of Allowances Approved for the Use of the Division of Social Welfare by the Medical Advisory Committee

The complete fee schedule contains 206 items but only the fees for the usual medical obstetric and infant care procedures are included in this list. Fees for other procedures will be supplied to physicians on request.

General

Call (country, day) per mile $1.00 first ten, then $.50 per mile.	
Call (country, night)—$1.00 plus mileage.	
Call (town, day)	$ 2.00
Call (town, night)	3.00
Call (hospital)	2.00
Call (hospital—out of town doctors)	3.00
Call (office, with 2 laboratory procedures)	2.00
Call (office—routine)	1.00
Consultation (plus mileage charge)	5.00
Intramuscular therapy	2.00
Intravenous therapy	3.00

Obstetrics

Abortion (therapeutic)	50.00
Bag insertion during labor; add to suggested allowance	10.00
Cesarean section	150.00
Delivery, normal, home, plus mileage	25.00
Delivery, normal, hospital	25.00
Ectopic pregnancy	150.00
Forceps delivery; add to suggested allowance	5.00
Miscarriage	25.00
Obstetrical consultation, plus mileage	5.00
Obstetrical version and extraction; additional charge	25.00

Immunizations—Complete Course

Diphtheria	2.00
Smallpox	1.00

Laboratory Work

Basal metabolism rate	5.00
Blood cell count (red)	1.00
Blood cell count (white	1.00
Blood count (differential)	2.00
Blood culture	5.00
Blood sugar (single test)	3.00
Blood sugar (tolerance test)	5.00
Electrocardiogram (including interpretation)	6.00
Hemoglobin determination (Dare, Sahli)	1.00
Phenolsulfonphthalein test	5.00
Sedimentation rate (blood)	3.00
Urinalysis	1.00
Venous blood for diagnostic tests	2.00

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

J. F. Du Bois, M.D., Secretary

Minneapolis Chiropractor Loses Basic Science Certificate and Chiropractic License

Re: State of Minnesota vs. Henry Wuerzinger

On January 12, 1943, Henry Wuerzinger, seventy-nine years of age, residing at 3453 Stevens Avenue South, Minneapolis, entered a plea of guilty in the District Court of Hennepin County, to an information charging him with the crime of practicing medicine without a license. Wuerzinger, a licensed chiropractor, was sentenced by the Honorable A. W. Selover, Judge of the District Court, to a term of one year in the County Jail of Hennepin County. The defendant was placed on probation for three years on the following conditions:

1. Defendant must surrender, for cancellation, his Minnesota Basic Science Certificate and his Minnesota Chiropractic License.
2. The defendant's medical and surgical equipment seized by the Minneapolis Police Department is to be turned over to Minneapolis General Hospital.

3. The promissory note in the sum of $75.00 obtained by the defendant from the patient at the time of the alleged abortion, is to be returned to the patient for cancellation.

Wuerzinger was arrested on October 8, 1942, following an investigation of his activities by the Women's Bureau of the Minneapolis Police Department and a representative of the Minnesota State Board of Medical Examiners. During the course of this investigation a twenty-two-year old unmarried Minneapolis girl stated that Wuerzinger had performed a criminal abortion upon her on June 23, 1942, at his then residence, 3859 Second Avenue South, Minneapolis. The patient stated that Wuerzinger charged her $125.00 in cash, and in addition thereto, demanded a promissory note from her for $75.00 dated July 1, and payable in fifteen days. When the police arrested the defendant at his home they seized Wuerzinger's examining table, surgical instruments, medicinal preparations and other similar articles. The police also discovered in Wuerzinger's possession, the $75.00 note executed by the patient. Following his arraignment in Court, the defendant insisted that he was too sick to stand trial. However, the examining physician stated that Wuerzinger was able to stand trial and the Court ordered the case set for January 12, 1943. Because of the defendant's age and the condition of his health, he was permitted by the Court, upon the recommendation of the County Attorney's Office and the Minnesota State Board of Medical Examiners, to plead guilty to the lesser charge.

Wuerzinger, according to the records of the Minnesota State Board of Medical Examiners, has been in Minnesota since 1907. During many of these years the defendant represented himself as a physician and surgeon, although the only license he ever held in Minnesota was a chiropractic license issued to him in 1919, by exemption. Wuerzinger also received his Basic Science Certificate in the same manner in 1927. He was indicted by the grand jury of Hennepin County in December, 1935, and charged with manslaughter in the first degree following the death of a Hopkins, Minnesota, woman, who stated that Wuerzinger had performed a criminal abortion upon her. Wuerzinger was never brought to trial in that case because of his alleged ill health.

The Minnesota State Board of Medical Examiners wishes to emphasize the splendid work done by the Women's Bureau of the Minneapolis Police Department in this case. The police women, under the able leadership of Lieutenant Blanche Jones, made a thorough investigation into the facts surrounding this case. Because of their vigilance the police discovered the $75.00 promissory note given Wuerzinger by the patient. This was the most valuable single item of evidence obtained by the State. The evidence obtained was undoubtedly a large factor in prompting Wuerzinger to offer to plead guilty to the lesser charge. The Minnesota State Board of Medical Examiners also appreciates the fine spirit of coöperation shown by the new County Attorney of Hennepin County, Mr. Michael J. Dillon, and his assistants, Mr. Peter S. Neilson and Howard Van Lear. Their insistance that his case be tried contributed greatly to the results accomplished.

Minneapolis Abortionist Sentenced to Four-Year Prison Term

Re: State of Minnesota vs. (Mrs.) Sophia Peck

On January 2, 1943, Sophia Peck, sixty-two years of age, was sentenced by the Honorable Frank E. Reed, Judge of the District Court of Hennepin County, to a term of not to exceed 4 years at hard labor in the Women's Reformatory at Shakopee, Minnesota. Mrs. Peck was convicted by a jury on December 3, 1942, of the crime of abortion.

The testimony at the trial showed that the defendant attempted to perform an abortion on an unmarried Minneapolis girl on July 17, 1942, by the use of a rubber catheter. The attempted abortion was a failure and the same procedure was repeated again on September 19, and September 24. The patient became seriously ill and was hospitalized twice in October. She subsequently recovered and testified for the State at the trial. The State also had as evidence catheters, instruments and medicinal preparations seized by the Women's Bureau of the Minneapolis Police Department at the time the defendant was arrested. The defendant told the Court that she was a tailor by occupation but had also engaged in the selling of cosmetics. Mrs. Peck holds no license to practice any form of healing in Minnesota, and at the time of her arrest resided at 59 North 15th Street, Minneapolis. Mrs. Peck was tried for a similar offense in October, 1937, but was found not guilty by a jury.

HEAR DISEASE NO BAR TO INDUSTRIAL EMPLOYMENT

Heart disease need not bar the patient in every case from industrial employment. Many thousands of heart patients and probably most of the 10 per cent or so of young men rejected for the army because of heart and blood vessel disease would qualify physically for positions in industry.

Statements to this effect were made by both Dr. Rufus B. Crain, of Rochester, N. Y., and Dr. O. F. Hedley, of the U. S. Public Health Service, before the committee on cardiac clinics of the New York Tuberculosis and Health Association.

From experience at the Eastman Kodak Company, Dr. Crain reported evidence that "with careful placement and medical supervision" persons with heart disease and high blood pressure "can be continued in employment without risk.

"This experience should encourage the hiring of individuals in the same category as new employes," he declared.

The right to work when physically handicapped is one of the practical, far-reaching gains for labor and society which is being reached through the war and which should be held after the war, Dr. Hedley pointed out.

In the case of heart disease the importance of continuing to make it possible for the patients to work can hardly be exaggerated, because with the aging of the population, the numbers with heart disease will continue to increase.

In the future, society will be faced with the choice of obtaining employment for the increasing group of heart disease patients or otherwise providing a means of livelihood through some form of taxation.—*Science News Letter,* January 30, 1943.

PERSIMMON LEAVES RICH IN VITAMIN C

When tea joins coffee on the list of scarcities, don't worry. Brew yourself a tasty cup from persimmon leaves—if you live where persimmons grow. It's good for you; full of scurvy-preventing vitamin C.

Prof. C. G. Vinson of the University of Missouri and Prof. F. B. Cross of Oklahoma A. and M. College report (*Science,* Nov. 6), that green persimmon leaves are rich in this essential vitamin. Freshly dried leaves sometimes have an even higher concentration. Green fruits also contain the vitamin, though not as much of it as the leaves; the vitamin apparently disappears to a large extent as the fruit ripens.

Tea made from chopped-up dried leaves was found to be a good vitamin source, and tasted rather well with a little sugar—"Similar to sassafras tea." Real tea was also tested, but proved to have only about 7 per cent as much vitamin C as the decoction from persimmon leaves.—*Science News Letter,* November 28, 1942.

INDUSTRIAL HEALTH

Edited by the Committee on Industrial Health and Occupational Diseases

A. E. Wilcox, Minneapolis, Chairman

H. B. Allen, Austin
L. S. Arling, Minneapolis
Martin Aune, Minneapolis
Richard Bardon, Duluth
P. H. Bennion, Saint Paul
R. B. Bray, Biwabik
R. P. Caron, Minneapolis
T. H. Dickson, Saint Paul
T. A. Lowe, South Saint Paul
J. L. McLeod, Grand Rapids
C. M. Smith, Duluth
H. G. Wood, Rochester

FITTING WORKERS TO THEIR JOBS

Clerical workers and executives in industry have probably enjoyed less than their share of benefits from modern medical services in industry according to Dr. T. Lyle Hazlett, medical director of the Westinghouse Electric and Manufacturing company, whose article on the subject, "What Are We Examining For," appeared in the December issue of *Industrial Medicine*.

Executives Studied, Too

Of especial interest was a survey described by Dr. Hazlett of the cardiovascular condition of 692 executives between the ages of 30 and 67 in the Westinghouse employ.

The study included electrocardiograms, blood pressure determinations, fluoroscopy for the study of cardiac contours, cardiac auscultation and urinalysis.

"It was found," Dr. Hazzlett reported, "that over 13 per cent of the group exhibited one or more abnormal findings. Over 11 per cent of the electrocardiograms revealed abnormalities; the blood pressure was found elevated in 7.6 per cent; fluoroscopy revealed abnormal heart contour in 9.2 per cent; auscultation showed four per cent to have significant cardiac murmurs and urinalyses were positive in four per cent. Of the latter, eight cases exhibited glycosuria which had been previously unsuspected. These findings would appear to suggest advisability of universal periodic examinations for workers in all divisions of industry. Such examinations should, as a rule, be of general character and not limited to one system."

Psychiatric Aspect Important

Dr. Hazlett also emphasized the importance of the psychiatric aspect of the industrial medical examination. This phase of the examination deals with the personality type and studies the individual from the point of view of emotional and intellectual traits. It is especially necessary, he believes, in this period of strain. The balanced personality with adequate social adjustments obviously brings to his job and to his vocational contacts qualities which are distinct assets both to his personal contentment and to his vocational success. "At present," he says, "little attention is paid to psychiatric factors; only the most marked abnormalities are apt to strike the examiner's attention.

"I mention this matter as a desirable element to develop in our examinations. Then, in passing, I should like to mention psychological tests of such traits as mechanical aptitudes, skill in certain types of performance, extent of information in certain subjects. These latter tests may well contribute to a more complete knowledge of the individual potentialities."

Pre-Placement Objective

The pre-placement examination, according to Dr. Hazlett, has for its major objective the assurance of the utmost degree of compatibility between the worker and his job, not only from the standpoint of job efficiency but from the standpoint of industrial hazards.

There are two aspects to this question. One deals with physical conditions which may be aggravated by certain types of work and the other with physical defects which will increase the accident hazard not only to the worker himself but to fellow workers as well.

"In the first class," he says, "we find the silicotic patient who, by continued exposure to silica dust, is under greater menace of tuberculous infection than the applicant with reduced vision, abnormal hearing, epilepsy and psychoneurotic traits. It must not be forgotten that, even with the best mechanical safeguards, the possibility of accidents exists and, in the majority of cases, the human factor and not the mechanical one, determines whether an accident will or will not occur. . . . This does not imply that the pre-

(Continued on page 222)

Minnesota Academy of Medicine

Meeting of October 14, 1942

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, October 14, 1942. The meeting was called to order at 7:40 p.m. by the president, Dr. Martin Nordland.

There were forty-eight members and two guests present.

Minutes of the May meeting were read and approved.

The scientific program followed.

THE MEDICAL MANAGEMENT OF PEPTIC ULCER

(Abstract)

MOSES BARRON, M.D.
Minneapolis, Minnesota

Treatment of uncomplicated peptic ulcer is practically always medical. Only certain complications are to be considered surgical. Rarely do the symptoms of uncomplicated ulcer persist after appropriate medical management so that surgery has to be resorted to. Peptic ulcer is one of the common causes of gastric complaints. In people over forty gall bladder causes distress more often than ulcer, especially in women. Most ulcers are duodenal, only about 5 to 6 per cent being gastric. Clinical ulcers are much more common in males than in females, about 85 per cent occurring in males. Gastric ulcers occur more commonly after the age of forty while more than 50 per cent of duodenal occur under the age of thirty. The exact etiology is not known but constitution and heredity are important factors. Many theories have been brought forth to explain ulcer development such as certain vascular changes, alterations in the nerve supply, focal infections and localized trauma from foods. The only almost constant finding associated with ulcers is acidity. Usually this is in excess. The importance of the acid secretion in the formation of clinical ulcers has been demonstrated experimentally by the production of ulcers in laboratory and domestic animals through repeated administration of histamine. Also the hyperacidity resulting from repeated and continuous stimulation of the vagus as well as the acidity induced by sham feeding produce ulcers in dogs. Wolf and Wolff[1] present an interesting study in the development of peptic ulcer in man. They show the relationship of anxiety and conflict to overactivity and hypersecretion in the stomach and the effect of this in turn on the development of ulcer. Such ulcers may finally progress to hemorrhage or perforation. Gastric ulcer may develop in cases of anacidity but these heal without producing clinical symptoms. As an illustration one never finds clinical ulcers developing in patients with pernicious anemia in whom, as is well known, achylia gastrica is always present. Since all ulcers probably start as simple erosions the presence of acid seems to be a factor sine qua non for the prevention of healing. Trauma from food may also be a factor. This is especially true if the gastric contents is projected against a particular area of the mucosa. The bolting of coarse food may add to the difficulty. I believe that not enough attention has been paid to the psychoneurogenic factors. It is quite apparent to everyone dealing with ulcer patients that they constitute a class notoriously highstrung, aggressive, sensitive and irritable. Some authorities claim that there is an association between the development of ulcers and lesions in the region of the pituitary and hypothalamus.

It is an interesting observation that perforations occur in men twenty-five times more frequently than in women. Fatal hemorrhages are also much more common in men. This in view of the fact that careful post-mortem studies of the stomachs have shown that asymptomatic erosions and small ulcers are even more common in young women than in men. They seem to heal before symptoms or chronicity develop.

It has been shown that in the treatment of peptic ulcer if alkali is used the duration of pain averages 2.8 days, but with the same diet, if beef extract is used the average duration of pain is twenty-six days. Worry, nervous strain, exertion and over-work tend to increase gastric secretion and therefore also the pain. The vitamin deficiencies of B_1 and A play apparently an unimportant part in the causation of ulcer. These deficiencies produce hypochlohydria and anorexia. Pure gastric juice has a capacity to destroy and digest living tissues, but when mixed and diluted with gastric contents it becomes practically inert toward such tissues. Whenever there is excessive secretion even during rest the healing of the ulcer is inhibited or delayed.

Pathogenesis.—Peptic erosions are common in many individuals and in the stomach are often multiple. These at first are superficial and heal readily without scarring unless certain factors delay it. Clinical duodenal ulcers occur mostly in males between twenty and fifty years. Most stomach ulcers are on the posterior wall of the lesser curvature, several inches above the pylorus. Duodenal ulcers become deep seated and develop intragastric and perigastric reactions. Since the gastric secretion has a corrosive action in producing the clinical ulcers, treatment resolves itself mostly to reducing and eliminating the acid.

Diagnosis.—Peptic ulcer is a common disease too frequently mismanaged. Too long delayed or improper treatment is probably the greatest cause of the com-

plications which may later necessitate surgical intervention. A careful detailed twenty-four hour history is important for diagnosis. X-ray studies are important to corroborate the diagnosis which can usually be arrived at from a careful history together with gastric analysis. The physical examination reveals little in ulcer except inconstant tenderness in the epigastrium.

Symptoms.—Pain in the epigastrium, gnawing, burning-like hunger pains from one to four hours after meals, with heartburn and gas distress and often sour eructations suggest the presence of ulcers. The distress is present when the stomach is empty and is usually relieved by food and antacid. Symptoms of activity may last from several weeks to several months, followed by prolonged and complete remissions.

Treatment.—In few diseases is it so important to get complete coöperation of the patient through a careful and detailed explanation of the rationale of the management. Most cases can be treated ambulatory with as good results as with complete rest in bed.

Diet.—A graduated diet which begins with milk, cereals, soft-boiled eggs and toast and which is gradually increased by adding more of the bland and less irritating foods forms the basis of the dietary management. The food should be well cooked and given in small amounts. Coarse rough foods, raw vegetables, nuts, mustard, catsup, condiments and highly seasoned foods must be avoided indefinitely. From one to four teaspoons of olive oil given before meals is of value as it helps inhibit gastric secretion. At first feedings principally of milk are given every hour, after about four weeks every two hours, and after two months three principal meals together with milk between meals and at bedtime. A special diet sheet giving foods permissible for a period of about two months should form the basis of ambulatory management.

Medication.—The old Sippy powders given twelve to fourteen times a day are no longer necessary. Many cases fared badly under that management because of either the development of alkalosis or the production of an acid rebound following some of the doses of alkali. Alkaline powders may be given after each of three meals and once or twice in the evening. With the milk at the hour feedings atropine in solution, about 1-125 gr., should be given four times during the day; also Amphojel or Creamalin should be given four or five times during the day in two teaspoon doses. Alutropin, preparations of magnesium trisilicate and Malcogel, may be substituted for the Amphojel. Concentrated vitamins, especially containing large doses of B and C, should be administered because of the restricted diet. If anemia is present iron should be administered. Benzedrine in 10 mgm. doses is very good for spasm. The patient should be under strict management for at least six months and after that under careful observation for at least a year. At first the patient should consult the doctor about once a week. If stomach distress should return at any time the patient should place himself at once on the second or third week diet.

Complications.—Many of the complications are surgical in nature. The most common one is partial or complete obstruction. This may be due to spasm, inflammatory edema or scarring. Careful management with large doses of atropine should relieve the obstruction very promptly if it is not due to scarring. For the latter surgery is indicated. The most characteristic symptom of obstruction is ulcer distress at a time when the stomach should be empty. In severe obstruction there is usually anorexia, epigastric fullness, nausea, vomiting and in thin individuals visible peristalsis. Midnight or early morning distress suggests gastric retention. The x-ray helps to establish the diagnosis. The next important complication is hemorrhage. Massive hemorrhages occur in asymptomatic ulcers in 50 per cent of the cases. The symptoms are weakness, breathlessness, fainting, hematemesis and tarry stools, also a posthemorrhagic anemia. Patients under forty-five years usually respond to medical management; in those over forty-five surgery is often necessary because of the tendency to fatal hemorrhage. The next important complication is perforation. The symptoms may be sudden, agonizing pains in the epigastrium with board-like rigidity. Slow perforations may occur in the posterior wall of the duodenum with pain, localized tenderness, fever and leukocytosis. The treatment is surgical.

Conclusions.—The management of peptic ulcer is medical, but many of the severe complications are surgical. For most cases ambulatory management is very satisfactory. The patient's confidence and coöperation must be obtained by careful explanation of the rationale of the treatment. Hyperacidity nearly always accompanies peptic ulcer. It apparently plays an important part in the production of clinical ulcers. Neutralizing mixtures are replacing the strong alkaline powders formerly used in the treatment of ulcer. In the early phase of this treatment patients should visit their physician frequently. Ulcers with obstructive symptoms should first be given thorough medical management before advising surgery. Surgery should be considered early in cases when massive hemorrhage occurs in patients over forty-five years old. The present-day medical management of uncomplicated duodenal ulcer brings gratifying results. Gastric ulcer because of the accompanying fibrosis and the possibility of superimposition of malignancy is more often surgical.

Reference

1. Wolf, Stuart, and Wolff, Harold G.: Genesis of peptic ulcer in man. Jour. A.M.A., 120:670-675, (Oct. 31) 1942.

THE SURGICAL MANAGEMENT OF PEPTIC ULCER—A CHEMICAL PROBLEM

(Abstract)

O. H. WANGENSTEEN, M.D.
Minneapolis, Minnesota

Surgery enjoys an important role in the management of ulcer, only because of ineffective and inadequate control of gastric acidity by conservative means. In other words, the surgical management of ulcer begins

with medical failures. The patient with an ulcer who is being managed satisfactorily by a dietary regimen is not a candidate for surgery. When sure and effective depressants of gastric acidity become available, the role of the surgeon in the management of ulcer will become a less important one than it is now. Surgeons who operate for the relief of ulcer will be the first to make this concession.

The frequency with which ulcer looms as a medical problem in the military forces indicates that the management of ulcer is a very live question. The medical military experience of the English and the Canadians in the present conflict suggests that, next to flat feet, ulcer is the most frequent cause of disability amongst enlisted men. Our own Medical Department is encountering ulcer as a frequent problem in the Armed Forces.

Operative procedures directed at the relief of ulcer which fail to reduce gastric acidity are potentially dangerous and should be abandoned. Only an extensive gastric resection (three-quarter resection) with complete excision of the antral mucosa affords real promise of effectual reduction of gastric acidity, the *sine qua non* of a satisfactory operation for ulcer. This operation can be done as a one-stage procedure in all ulcers (except acute perforation) and with minimal mortality (2 to 3 per cent). This procedure appears to rid the patient for good and all of the ulcer diathesis. As far as is known now, it does not compromise the future for him in any important manner. After the lapse of a few months (three to four) the gastric capacity of these patients becomes quite normal again. During that interval, it is important that the patient eat often. No other dietary strictures are enjoined on the patient. Meat, vegetables and fruit which ulcer patients frequently have been denied, become for months and even longer, the favored object of the gustatory explorations of these patients. Ulcer patients accustomed to a somewhat liberal intake of fat may lose weight after operation. With an eye to maintenance of optimal weights for a given height, patients who are below weight at the time of operation are cautioned that they continue a moderately liberal intake of fat, lest they lose weight. For the overweight patient, the new dietary allowances are particularly welcome.

Sealed occult perforation of a duodenal ulcer, in the experience of this clinic, is the most frequent cause of pyloric obstruction. Usually such obstructions relent on constant intragastric drip feeding of a high protein and carbohydrate fluid mixture (Varco gastric diet No. 2) permitting a one-stage resection.

The frequency with which benign and malignant ulcerative lesions are confused suggests the necessity of more frequent operation for gastric ulcer than has been common practice in the past decade.

The operation is to be done with care and deliberation. The experience of this clinic suggests that long operative procedures on patients well prepared for operation are well withstood. More notice should be taken by the surgeon of the length of the hospital stay and the total recovery period, with less emphasis on the length of time spent by the patient on the operating table. It is high time that the traditional interest of the surgeon in the length of the operation, so important in preanesthetic days, be discontinued. In civil surgery there is no need for haste. The planned procedure in practiced hands affords the greatest promise of success.

The importance of employing short or no loop (jejunal) anastomoses in gastric resection for ulcer is pointed out. Spatial separation of the new gastric outlet from the site of entry of bile and pancreatic juice into the intestine by employment of a long jejunal loop invites stomal ulcer. Another probable effect of the same agency is diminution of absorption of secretin from the duodenal mucosa with decreased secretion of alkaline pancreatic juice with high buffer value containing sodium carbonate. On the thesis of Mellanby's consideration of bile as an additional alimentary stimulus for pancreatic secretions, it is suggested that excision of the gall bladder may prove of some value in combating the acid ulcer diathesis.

There are many things yet to be learned about the ulcer problem. It is becoming increasingly evident, however, that the acid-peptic digestive capacity of the gastric juice is the most important factor in the causation of ulcer. The magnitude of the problem of effective control of gastric acidity is real and frequently cannot be achieved consistently by available conservative means. Only operations which reduce effectively the gastric secretory capacity of the stomach have any place in the surgical management of ulcer.

Discussion

Dr. R. T. La Vake (Minneapolis): I would like to ask Doctor Wangensteen a question. Several years ago I had a patient with preeclamptic toxemia who developed a continuous pain in the epigastrium. This is supposed to be a not uncommon symptom of late toxemia. This has not been my experience, however. Her internist, who had taken care of her from birth, felt sure that it was not a gastric or duodenal ulcer. After three weeks' treatment under hospital regime, labor began spontaneously at the beginning of the thirty-second week of pregnancy. She delivered a live premature infant very easily; but, while taking gas, she suddenly stopped breathing; but was finally resuscitated with artificial respiration, and went back to bed after delivery seemingly in excellent condition. Twenty-four hours later she developed pain and distension of the abdomen. Usual treatment for gas distension following delivery was instituted but to no avail; and she finally died.

Her internist felt that the diagnosis must be mesenteric thrombosis. An autopsy was granted, and general peritonitis from a ruptured duodenal ulcer was found.

When I was an intern at the New York hospital, it so happened that we had many perforating ulcers, and I thought that I would never in my life miss a perforation of an ulcer. Her abdomen was soft, not rigid. Were I to see another like case tomorrow, I would mistake the diagnosis.

Ever since this episode, I have wondered if we have been correct in our interpretation of epigastric pains in late toxemia. May it not be a sign indicating the advisability of x-ray gastro-intestinal studies? Certainly epigastric pain in late toxemia is not more frequently found than gastric and duodenal ulcer in nonpregnant women. Have you had any experience with perforation in pregnancy?

Dr. O. H. Wangensteen: The experience which Doctor La Vake relates is unusual. In the first place, we have been led to believe that an active ulcer during pregnancy is decidedly unusual. As a matter of fact, a search for substances in the urine of pregnant women

which would depress gastric secretion had its origin in the observation that remission from the symptoms of ulcer during pregnancy was frequent. In this connection, it may be of some interest to relate that my colleague, Doctor Lyle J. Hay, who is now abroad with United States General Hospital 26, was able to produce ulcers regularly by the histamine-beeswax method, in pregnant animals of several species. As yet, however, we have been unable to produce ulcers in the fetuses of such pregnant mothers in any species of animals by stimulating the endogenous gastric secretory mechanism by employment of the histamine-beeswax technique. This interesting paradox may suggest that there is no secretion of hydrochloric acid before birth by the stomachs of those species of animals injected. On the contrary, there are reported a few instances of spontaneous *in utero* perforation of gastric or duodenal ulcer in the human fetus.

The absence of abdominal rigidity in Doctor La Vake's patient is unusual. It is possible that the stretch of the abdominal muscles incident to pregnancy precluded the presence of rigidity. Ordinarily, however, pain and tenderness, both owing to the escape of a severe irritant, namely, gastric juice, into the peritoneal cavity, should have been present. Shock is a late phenomenon of perforation. Early after perforation, both pulse and blood pressure are unusually normal. It seems very odd that the usual symptoms of perforation should not have been in evidence. A roentgenogram with the patient in the left decubitus position, or sitting, would have been helpful. These films together with a scout film of the abdomen are often helpful in borderline acute abdominal lesions of any kind.

The meeting adjourned.

E. V. Kenefick, M.D.
Secretary.

Meeting of November 11, 1942

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, November 11, 1942. The meeting was called to order at 8:10 p.m. by the vice president, Dr. H. B. Zimmermann.

There were forty-two members and one guest present.

Minutes of the October meeting were read and approved.

Dr. L. E. Daugherty read the following Memorial to Dr. Harry Parks Ritchie, a member and Past President of the Academy, who died on September 3, 1942. And a motion was carried that it be spread on the permanent records of the Academy and a copy sent to Dr. Ritchie's family with the condolences of the members of the Academy.

HARRY PARKS RITCHIE

1873-1942

Dr. Harry Parks Ritchie died September 3, 1942.

His father, Dr. Parks Ritchie, came to Saint Paul in 1881. He was one of the leaders in the medical profession and was a charter member of the Minnesota Academy of Medicine and its President in 1889. He was Dean of the University Medical School at a critical time in that institution's history—from 1897 to 1906.

Harry Ritchie attended the public schools in St. Paul and went to Yale where he was graduated in 1893. He then attended the University of Minnesota Medical School and received his degree in Medicine in 1896. He taught physiological chemistry under Dr. Beard. His internship was served at the Ancker Hospital with Dr. Warren Dennis, Dr. Walter Ramsey, and Dr. Frank Warren. Shortly after serving his internship, he joined the 13th Minnesota Regiment and was in the Philippines during the Spanish American War. He was a Captain in the Medical Corps.

After the war he joined Dr. Archibald MacLaren and Dr. DeWitt and, after Dr. DeWitt's retirement, he remained with Dr. MacLaren and was associated with him for many years.

Because of his father, his whole life was spent in an atmosphere of medicine and his close association with such men as Drs. C. A. Wheaton, John Rogers, Robert Wheaton, John Rothrock, James Moore, Alexander Stone and MacLaren, and other leaders of that time, his opportunity was great and he made the most of it.

For many years Dr. Ritchie was Associate Professor of Surgery at the University and served that institution well and faithfully. While teaching at the University he became interested in plastic surgery and later in the repair of cleft palate and harelip. His work in this specialty was nationally known.

Dr. Ritchie read his Inaugural thesis at a meeting of the Minnesota Academy of Medicine on February 4, 1903. His subject was "Vaginal Section and Drainage for Suppuration in the Pelvis." He was elected Secretary of the Academy in 1920 and became its President in 1924.

It was my privilege to be associated with Dr. Ritchie for many years and his outstanding excellent characteristics are too many to mention. I do recall that I never heard him speak disparagingly of any one and this was particularly true of the medical profession. His love of children was sincere and great and I believe that the happiest days of his professional career were those spent in correcting their deformities.

His sons, Dr. Wallace Ritchie and Edwin Ritchie, are now with the armed forces of the United States Army.

L. E. Daugherty, M.D.

MALIGNANT MELANOMAS OF THE UVEA AND THEIR PROGNOSIS

FRANK E. BURCH, M.D.
Saint Paul, Minnesota

The great preponderance of all intraocular tumors encountered in ophthalmic practice falls under the group of malignant melanomas of the uveal tract. They have been previously spoken of as sarcomas of the choroid. All are primary growths, about 80 per cent involving the choroid proper, about 16 per cent involving the ciliary body and choroid, and the balance originating in the iris itself. Metastatic sarcomas of the choroid are extremely rare. Gliomas are found only in childhood, are usually congenital, attaining growth as the eye grows from a 16 mm. to a 24 mm. length during the first eight years of life. Practically the only other intraocular tumor met with and then only rarely is a metastatic carcinoma from cancer of the breast, lungs, uterus, or elsewhere.

The incidence of sarcomas is approximately one in three thousand eye cases. The symptoms of beginning melanoma begin with impairment of vision if the posterior pole is involved or a scotoma in the field of vision corresponding to the site of the growth. The scotomas are usually enhanced by the development of retinal detachment in due time and one of the first considerations in study of retinal detachments is the exclusion of an underlying primary growth. As the melanoma increases in size, necessarily it encroaches upon the vitreous chamber or directly causes obstruction to circulation of intraocular fluids and induces glaucoma. If a glaucoma becomes intense it, in turn, may make the diagnosis of melanoma difficult. Thus it will be readily understood why, in cases of retina and fulminating glaucoma, one must ever bear in mind the possibility of an intraocular growth.

Doctor Camp and the author have endeavored to analyze all the histories of melanoma patients encountered at the University Hospital or in private practice, together with all the specimens submitted to our University Eye Laboratory for diagnosis. We have collected 113 histories and enucleated eyes. This analysis has had as its objectives: first, determination of the prognosis, not only in regard to melanomas in general, but also the prognosis according to the type of melanoma. As Dr. Camp will show you, there are five distinct types of intraocular malignant melanoma with variable prognosis dependent upon the type. A pure spindle-cell type affords a very excellent prognosis; on the other hand, the epithelioid type, the fascicular type and the mixed cell group are by no means so favorable as regards prospect for longevity. Our second objective in this research has been to determine the influence of irradiation upon the cytology and indirectly upon metastasis and prognosis in general. One of our further objectives is to determine the effect upon any migrating tumor cells in the orbit of post-enucleation irradiation. Fifty-three patients received postoperative irradiation. It will require a much longer follow-up of our cases to determine whether or not the insertion of radium in the orbit, or treatment with x-rays after enucleation, affords any insurance against local recurrence or development of metastasis. In any event, our melanoma ledger is now in shape to be continued for another decade or two by our department.

Melanomas of the uveal tract are not like melanomas elsewhere in the body. The prognosis for malignant melanomas in other parts of the body has never been considered favorable. Broders and McCarthy traced only four patients with five-year cures in seventy patients. Bloodgood reported only one five-year cure in over 200 malignant melanomas operated by him. In contrast to this, malignant melanomas of the uveal tract enjoy a relatively favorable prognosis. Pahwa, in a recent analysis of 100 cases seen prior to 1935, found that fifty-one were alive after five years. However, no age is exempt from metastasis or recurrence. In a case of Dr. Anderson Hilding's of Duluth, metastasis in the chest and recurrence in the orbit developed sixteen years after enucleation. If we could make biopsies before enucleation, we might be able to determine the prognosis from type and fiber content with some fair degree of accuracy.

In our series of 113 cases, all but 94 were over forty years of age. Another factor influencing prognosis is the fact that many of these patients come when the tumor growth has already attained relatively large size, indicating a growth of many months. Frequently the history reveals that there has been impairment of vision over a period of one or two years. In thirty-five instances glaucoma is recorded. Sometimes the diagnosis is not made until the eyeball is sectioned following enucleation of an intensely painful, blind glaucomatous eye. So that doubtless, in nearly every case, there has been plenty of time for metastasis to develop before a diagnosis of melanoma is made, or enucleation is done.

Even in some very small tumors we have found tumor cells within the lumen of vessels or extensions along emissary vessels and nerves. In five instances penetration through the sclera was noted. Altogether such microscopic extensions or macroscopic penetrations of the sclera are recorded in twenty-two of our series. Twice an undiagnosed melanoma was found on section of phthisical bulbs. With all these local extensions and penetrations of the sclera, it is noteworthy that actual recurrence in the orbit has developed in only six instances. It would seem obvious, therefore, that nature must provide some systemic resistance, or that tumor cells atrophy or undergo necrosis, or that some phagocytic or chemical destruction occurs locally as a means of preventing metastasis and local recurrence. Since acute or absolute glaucoma was recorded in over one-third of our series, which is indicative of an advanced stage of growth, one would expect such cases to be more likely to develop metastasis, or at least local recurrence; but, such is not the case. In only one of these glaucomas, many of which also showed evidences of tumor cell migration, has a secondary orbital growth developed to date, whether radium was inserted or otherwise, and in only eleven of the thirty-nine instances recorded has metastasis developed elsewhere.

It is conceded that all malignant melanomas are radioresistant, or at least not radio sensitive. No attempt has been made to cure malignant uveal melanoma by irradiation. No evidence has ever been accumulated in ophthalmic literature to condemn prophylactic radiation therapy as a means of prevention of metastasis from intraocular malignant melanoma. McKee, Wood, and others have condemned its use as not only valueless but as actually harmful; that melanotic tumors are aggravated and metastasis favored by this line of therapy. R. Foster Moore and H. C. Stallard made attempts to treat melanoma of the choroid by implants of radium and radium sewed to the sclera over the tumor. We have attempted this in two cases and noted a shrinkage in the globe. Stallard concluded, "There is no doubt that for a time the neoplasm becomes more translucent and small. It is probable that some of the sarcoma cells are destroyed, and that these tumor cells treated by phagocytes are eventually absorbed by the blood vessels." Some twenty years ago we conceived the idea that by preliminary irradiation of intraocular malignant melanomas it might be possible to "sterilize" the growth,

so to speak, and then, by waiting until the full effect of irradiation was achieved, to enucleate the eye. Since most cases were seen when the growth was well developed, and opportunity for metastasis had probably existed for some months, we believed that a delay of four weeks, or thereabouts, until the full effects of irradiation were attained could probably afford only slight further opportunity for metastasis. Some cases were seen in which excellent vision was still maintained at the time of diagnosis. In others, the patient could not be reconciled to enucleation when the diagnosis and the prognosis was explained. In one notable case in which malignancy developed from a benign melanoma of the choroid observed by us over a period of thirteen years, the affected eye was the patient's only useful eye. Such cases as mentioned seemed favorable for prophylactic radiation therapy—if any cases were favorable.

In consultation with roentgentherapists, and we are especially grateful to Professor Stenstrom for his help in the matter, a fairly standard irradiation procedure was carried out at the University. A total dosage of 1500 roentgens, as measured by air, was employed in divided doses over a period of fifteen days. For the anterior field a 4 x 5 cm. and for the bilateral field a 4 x 6 cm. field was cross-fired in a series of thirty-five patients. In the main, a 200 kilovolt, 60 cm. target skin distance with a half millimeter copper filter for the anterior field and a one millimeter copper filter for the lateral field, was used. One millimeter of aluminum was always used as a secondary filter. Whenever possible the eye was not enucleated until one month after irradiation. Thirty-five cases were radiated, in most instances according to the above formula. Our study of the follow-ups and, more particularly, study of the effect upon cell structure by Doctor Camp, has failed to prove the value of radiation therapy in the treatment of intraocular malignant melanomas. Moreover, the results would seem to indicate that no one of the five cell types has responded to this form of therapy very favorably. This analysis, of course, does not include a very large series, but to us it has been sufficiently convincing. Perhaps over a long period of time follow-up data may alter our statistics slightly. That the dosage has been sufficient seems probable, because there have been several cases followed by contraction of orbital tissue—in a few, actual radium burns. Any effective radiation dosage (we must conclude) which *might* destroy tumor cells would damage healthy, adjacent tissues and the resistance which they naturally afford. If local adjacent cell resistance is damaged by an overdosage of x-rays or gamma rays, especially if local blood supply is impaired by their use, one might expect an unfavorable sequence.

Doctor Camp will enlarge upon this subject but, from our experience with prophylactic radium therapy for the purpose of arresting growth, preventing metastasis, and improving the prognosis, the conclusion is now very definite that this form of therapy is valueless. Whether or not irradiation immediately after enucleation, given for the purpose of preventing local recurrence or extension of tumor cells into the circulation accomplishes any purpose, will require longer observation of the series in which it has been employed in order to determine the facts. As a result of our experience in this small group of cases, however, we must conclude that:

1. Even with intensive irradiation its action is uncertain in all types of malignant melanoma.
2. Roentgen therapy offers no assurance against metastasis; there is a bare possibility, when complete figures are available covering a longer period, that metastasis develops earlier after prophylactic use of irradiation than when it is not so employed.
3. Irradiation should be reserved for cases in which the tumor-containing eye is the only one retaining vision, for cases where the patient refuses enucleation, and those in which the tumor has already invaded the orbit and adjacent structures.
4. Early diagnosis and immediate enucleation remain of greatest value in prognosis.

PROGNOSIS OF MALIGNANT MELANOMATA OF THE UVEA FROM THE STANDPOINT OF PATHOGENESIS, CYTOLOGY AND FIBER CONTENT

WALTER E. CAMP, M.D.
Minneapolis, Minnesota

Probably no other group of tumors has given rise to as much controversy and argument in the matter of histogenesis or pathogenesis as has malignant melanomata of the eye. Since these tumors were first described as melanoses by Laennec in 1819, they have variously been classified as sarcomata (leuko-sarcomata and melano-sarcomata); endotheliomata; peritheliomata; chromatophoromata; melanoepitheliomata; and lastly, neuroblastomata or neuronevus, or tumors of neurogenic origin.

Our present concept is that these tumors of the uvea belong to a larger group of similar tumors, all of neurogenic origin. The origin of this class of tumors from the cells of the sheath of Schwann of the nerves, or of the nerve end organs was first shown by the work of Verocay (1910); by Harrison (1924) and Masson (1926-32); Laidlaw and Murray (1933); and lastly by Theobold (1937), the latter applying the findings of the previous writers to the eye, particularly the uvea.

Now that the problem of pathogenesis has been fairly well established, the pathologists have in recent years concerned themselves chiefly with a study of the prognosis of these growths.

In addition to the general rules of malignancy laid down by pathologists for all tumors, probably the most contributory studies on the prognosis of malignant melanomas of the uvea have been made by the cytological studies of Callender and the "fiber content" studies of Callender and Wilder.

Callender, in 1931, reported on 111 cases of malignant melanomas of the eye and classified them into

five groups on the basis of cell types and arrangement of cells.

The spindle cell is the most frequent of all cell types, forming the entire mass of some tumors and part of the so-called mixed cell type and fascicular type. It may be subdivided into:

I. *Spindle Cell A*
Spindle cells small, densely packed and seldom show a well-defined nucleolus—Tumor usually heavily pigmented.

II. *Spindle Cell B*
Larger spindle cells—fairly large chromatic nucleus with well-defined nucleolus—pigment moderate or slight in amount. These cells always are a component of the so-called mixed cell type and fascicular type to be described below.

III. *Epithelioid Type*
Large rounded or polygonal cells with chromatic nucleus and large nucleolus Many cells multinucleated and occasionally quite large. Pigment usually moderate or slight. This type of cell is also found in the mixed cell type.

IV. *Fascicular Type*
Spindle shaped cells with a large nucleolus resembling Spindle B above and with occasionally rounded or polygonal forms. Cells arranged in columns or fasciculi—the long axis of the cell being at right angles to the column. The cells are arranged around a lymphatic or a blood vessel. Pigment is usually scanty, but occasionally may be abundant. This cell arrangement may also be found in the mixed cell type.

V. *Mixed Cell Type*
Usually most common type of cellular structure in malignant melanoma of the eye. A mixture of spindle cells and epithelioid cells with areas of fascicular arrangement. Some areas of tumor deeply pigmented; others devoid of pigment.

From an analysis of Callender's cases, he shows that the epithelioid type is most malignant; fascicular type next; then mixed; and lastly Spindle B and Spindle A.

If the prognosis of these cases of malignant melanomas of the uvea is compared to other cancers, i.e., a five-year cure, it will be seen that in class Spindle A, two of the eleven cases followed were dead in five years; in Spindle B, none of twenty cases that were followed; in the fascicular type, two of six cases (33⅓ per cent); in the epithelioid type, four of ten cases (40 per cent); in the mixed cell type, eighteen of fifty-five (32 per cent) of the cases followed.

At the University Hospital laboratory, we have studied ninety-seven cases of malignant melanoma of the uvea contributed from the Miller Hospital, University Hospital, and private physicians, who were kind enough to send in specimens for study. We have complete "follow-ups" on ninety of these cases.

They have been classified and studied similar to those of Callender, and we have the following results after a six-year period:

Classification	No. Dead	No. Cases	Per Cent
I Spindle A	1	8	12
II Spindle B	6	29	20
III Epithelioid	11	22	50
IV Fascicular	6	9	66
V Mixed Cell Type	7	29	25

As a further aid to prognosis, Callender and Wilder, with a modification of Foot's stain, were able to impregnate these tumors with silver salts to show an argyrophil reticulum. In a study of two hundred and five tumors, so stained, they classified them into three large groups depending upon their fiber content.

Group 1. Those having no fibers or fibers only in the interlobar stroma.
Group 2. Those having areas with and without fibers (combination of 1 and 3). This group subdivided into:
(a) Tumors having a preponderance of fiberless areas.
(b) Tumors having areas with and without fibers approximately equal.
(c) Tumors having a definite preponderance of areas containing fibers.
Group 3. Tumors having fibers among the tumor cells throughout all areas.

In their group of two hundred and five cases studied, they have followed forty-six for a period of five years or more. The mortality of the various fiber groups are shown in the following table:

Class 1	100 per cent deaths
Class 2a	87 per cent deaths
Class 2b	76 per cent deaths
Class 2c	22 per cent deaths
Class 3	0 per cent deaths

In our series of ninety-seven cases, we have fiber stains, on twenty-nine cases that have been followed for a period of six years or more, and find the following mortality in six years in the various fiber groups:

Classification	No. Cases	No. Dead	Per Cent
Fiber Group 1	0	0	0
Fiber Group 2a	8	5	61
Fiber Group 2b	15	2	13
Fiber Group 2c	6	1	17
Fiber Group 3	None		

In comparing the various fiber groups with the cell type groups, it is found that of the total of eight dead, of twenty-nine cases after six years—two were Spindle B, one fascicular, three epithelioid, and two mixed cell types.

The greatest variation of our mortality in the various groups from that of Callender and Wilder is found in Group 2b, where we have only 13 per cent and they have 76 per cent. A larger series of cases would probably give more uniform results.

Discussion on Papers by Doctor Burch and Doctor Camp

Dr. H. B. Zimmermann, Saint Paul: I was much interested in the papers of Doctors Burch and Camp, especially their observations of the varying degree of malignancy observed in these tumors. More and more abdominal surgeons, by using silver impregnation techniques, have demonstrated that nerve sheath tumors are not at all uncommon in the abdomen and retroperitoneal space. As I understand Doctor Camp, he feels that he is able, in a measure, to determine the malignancy of Schwann sheath tumors of the eye by the richness of the collagen fibers as demonstrated by the silver impregnation stain. I do not recall that this observation has ever been made on intra-abdominal Schwann sheath tumors. If there are any pathologists present tonight, I wish they would discuss this point.

Dr. Arnold Schwyzer, Saint Paul: One cannot help being greatly surprised at the large number of cures Doctor Burch has had in melanomatous tumors. That is very different from what we see in general surgery. A man like Doctor Bloodgood of Johns Hopkins, with the large material there, had seen only one five-year cure. It must be we have some special conditions. Many may not be as malignant as in the rest of the body. One sees them early in the eye when they are still small; while the surgeon usually gets them when they are already of pretty good size.

When I saw the program, I hunted for the notes of a case I thought might be of general interest and also looked up the microscopic sections. The tumor cells had the appearance of epithelial tissue with large nuclei with little cytoplasm and no intracellular substance to be made out nor any cell membranes, only here and there a little connective tissue. The picture resembled mostly what Doctor Camp in his wonderful demonstration had shown as Class 4 of his cases. There was some pigment here and there, and macroscopically the growths were moderately melanotic.

The woman I speak of above, came to me in October, 1937, with a lump on her right arm. She had a little pain in it but said she knew that it was nothing serious. Her doctor had told her it was simply a fatty tumor. Then she had gone to a clinic a short while before I saw her. A biopsy had been done, and she had the report that it was benign. The tumor was the size of a small plum. It seemed like it was attached to the deltoid fascia underneath. I told the patient it was serious and excised the mass with much healthy fat surrounding it and also took along the fascia of the deltoid underneath.

Large doses of radium and x-ray were then given, and she stayed well until December, 1938, when she had an abscess in the midline above the promontory due to appendicitis. The appendix was removed and the patient recovered, but in February, 1939, she returned to the hospital with a hemoglobin of only 35 per cent and the stools black with blood. After massive transfusions, an x-ray showed she had a tumor in the stomach the size of a hen's egg rather far up on the greater curvature and posterior wall. The stomach was resected, and she then felt well until the summer of 1939 when the hemoglobin had again come down, and in August and October she received blood by transfusions. In October, on return from my vacation, I found a large mass in the mid abdomen and the stools again contained much blood. We had to resect about 18 inches of ileum together with the mesentery into which the growth had progressed. Again, it was a slightly melanotic, soft growth, the same in character as the growth on the arm and of the stomach. She felt well then for two years, but in October, 1941, was attacked by a sudden intestinal obstruction. Two loops of ileum were grown firmly together and through the slit in the mesentery another loop had become strangulated. These adhesions were undoubtedly remnants of her appendiceal abscess. Last spring she made us aware of a small tumor above the left knee which was excised and proved to be a simple fat necrosis—perhaps from a hypodermic. About two weeks ago she came to the office asking for some medicine because she did not want to grow too fat.

Dr. Frank E. Burch, in closing: I am grateful to Doctor Schwyzer for giving us the general surgeon's experience as it relates to our subject. In considering prognosis, I wish some one could tell us what happens to these tumor cells when they wait ten or twelve years before they start secondary growth somewhere else; how they remain dormant; and why metastases develop so uniformly in the liver. Doctor Newton, of Dallas, Texas, in 1938 reported a case where a local recurrence came after twelve years, but without evidence of metastasis elsewhere. However, when I saw him recently and asked him about it, he said the patient died of metastasis in the liver a year later. He had a recurrence in the orbit after twelve years and after fifteen years developed metastasis of the liver.

I would like to compliment Doctor Camp for the tremendous amount of work he has done in classifying these tumors and for the painstaking work he has done in examination of sections to find out the influence of "fiber content" on malignancy and its relation to prognosis.

Dr. Walter E. Camp, in closing: I want to compliment Doctor Burch for his untiring efforts in following up these cases; there has been a great deal of work to it. I also want to compliment Mr. Morris on his fine color photography of these slides.

Dr. Arnold Schwyzer, of Saint Paul, read a paper on "White Bile." This will be published in full, separately.

The meeting adjourned.

E. V. Kenefick, M.D.
Secretary.



Orthopedic Braces and Appliances

Physicians' specifications followed precisely. Scientific manufacture and fitting.

AUGUST F. KROLL
Manufacturer
230 WEST KELLOGG BLVD.
St. Paul, Minn. CE. 5330

ZEMMER

Prescribe or Dispense Zemmer Pharmaceuticals
Tablets, Lozenges, Ampoules, Capsules, Ointments, etc. Guaranteed reliable potency. Our products are laboratory controlled. Write for catalogue.
Chemists to the Medical Profession
THE ZEMMER COMPANY Min-2-43
OAKLAND STATION • PITTSBURGH, PENNSYLVANIA

In Memoriam

HIRAM J. LLOYD

Dr. Hiram J. Lloyd, a well known citizen of Mankato and a member of the Mankato Clinic, died December 14, 1942, following a period of ill health for nearly two years.

Hiram Lloyd was born on December 31, 1876, near Judson in Butternut township. He taught school for a number of years before studying medicine at the Chicago College of Medicine and Surgery where he received his medical degree in 1910. After serving an internship in Chicago for a year he began the practice of medicine at Lake Crystal in 1911. Five years later he opened an office in Mankato where he practiced continuously except for a period of service in the army medical corps in 1917 and 1918. After a year overseas he returned to Mankato.

Before studying medicine Dr. Lloyd was in charge of music at the Moody Institute in Chicago. He was endowed with a fine tenor voice and conducted a number of musical organizations in Mankato. Among these were the Mankato Orpheus Club, the Ladies Glee Club and the choir of the Welsh Presbyterian church. He also sang in the choir of the First Presbyterian church for about fifteen years.

One of the outstanding musical events of the community was the oratorio "Elijah" presented in 1927. On other occasions "Creation" and "The Messiah" were rendered under his direction.

Dr. Lloyd was a member of the American Legion, the Disabled War Veterans, Veterans of Foreign Wars, the Masonic Lodge, Knights Templar, Kiwanis Club and was a member of the Blue Earth Medical Society, the Minnesota State and American Medical Associations. He was a member of the Welsh Presbyterian church where in 1935 he organized the present church choir and directed it for a number of years.

On November 9, 1904, he married Margaret Jones and last year their anniversary was celebrated at St. Joseph's Hospital, where he was a patient, with a reception for his many friends.

Dr. Lloyd is survived by his wife; two sisters, Mrs. Margaret Lloyd Davies, Mankato; Mrs. John B. Jones, Lake Crystal; and two brothers, John Reese Lloyd, Palo Alto, California; and Elias Loyd, Monticello, Florida.

OLE SAMUEL SWENNES

Dr. O. S. Swennes of Wahkon, Minnesota, died suddenly of a heart attack December 20, 1942, at the age of seventy-five.

Dr. Swennes was born March 12, 1867, in Barre Mills, Wisconsin. He received his Bachelor of Arts degree from Luther College in Decorah, Iowa, in 1891. His medical degree was obtained at Rush Medical College in Chicago in 1894. After practicing at Northfield and Milaca, in 1898 he moved to Wahkon.

In 1904 Dr. Swennes was married to Severa M. John-

There Is NO Essential DIFFERENCE Between RED LABEL and BLUE LABEL KARO

These two types of KARO differ only in flavor. In chemical composition they are practically identical. Their caloric values are the same.

If your patients find grocers temporarily out of one type, the same amount of the other may be prescribed.



How much KARO for Infant Formulas?

The amount of KARO prescribed is 6 to 8% of the total quantity of milk used in the formula—one ounce of KARO in the newborn's formula is gradually increased to two ounces at six months.

CORN PRODUCTS REFINING CO.
17 Battery Place • New York, N. Y.

Cook County Graduate School of Medicine

(In Affiliation with Cook County Hospital)

Incorporated not for profit

ANNOUNCES CONTINUOUS COURSES

SURGERY—Two Weeks' Intensive Course in Surgical Technique starting February 8 and 22, March 8 and 22, and every two weeks throughout the year.

MEDICINE—One-month Course in Electrocardiography and Heart Disease starting the first of every month, except August.

FRACTURES AND TRAUMATIC SURGERY—Formal and Informal Courses.

GYNECOLOGY—Two Weeks' Intensive Course starting April 5; Clinical and Diagnostic Courses.

OBSTETRICS—Two Weeks' Intensive Course starting April 19; Informal Course.

OPHTHALMOLOGY—Two Weeks' Intensive Course starting April 5.

OTOLARYNGOLOGY—Two Weeks' Intensive Course starting April 19.

ROENTGENOLOGY—Courses in X-ray Interpretation, Fluoroscopy, Deep X-ray Therapy every week.

UROLOGY—Two Weeks' Course and One-month Course available every two weeks.

CYSTOSCOPY—Ten-day Practical Course every two weeks.

General, Intensive and Special Courses in All Branches of Medicine, Surgery and the Specialties.

TEACHING FACULTY — ATTENDING STAFF OF COOK COUNTY HOSPITAL

Address: Registrar, 427 S. Honore St., Chicago, Ill.

PROFESSIONAL PROTECTION

SINCE 1899 SPECIALIZED SERVICE

In addition to our Professional Liability Policy for private practice we issue a special

MILITARY POLICY

to the profession in the Armed Forces at a

REDUCED PREMIUM

THE MEDICAL PROTECTIVE COMPANY OF FORT WAYNE, INDIANA

son. He is survived by his wife and three children, Ordway and Mrs. Alvin Mann (Mildred) of Washington, D. C., and Telford of Atlanta, Georgia.

Until recently Dr. Swennes was a member of the East Central Medical Society, the Minnesota State and American Medical Associations.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR FEBRUARY

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Saturday morning over Station WCCO, Minneapolis and St. Paul, and at 11:30 o'clock over Station WLB, University of Minnesota. Speaker: William A. O'Brien, M.D., Director of Postgraduate Medical Education, Medical School, University of Minnesota.

February 6—Rheumatic Fever—Signs and Symptoms
February 13—Rheumatic Fever—Diagnosis
February 20—Rheumatic Fever—Treatment
February 27—Focal Infections

E. STARR JUDD LECTURE

Dr. Alfred Blalock of Baltimore, Maryland, Professor and Director of the Department of Surgery at the Johns Hopkins Hospital, will give the tenth E. Starr Judd lecture at the University of Minnesota in the Museum of Natural History Auditorium on Thursday, March 11, 1943, at 8:15 p.m. The subject of Dr. Blalock's lecture is "Traumatic Shock with Particular Reference to War Injuries."

MINNESOTA SOCIETY OF NEUROLOGY AND PSYCHIATRY

The regular meeting of the Minnesota Society of Neurology and Psychiatry was held at the Town and Country Club, Saint Paul, Tuesday evening, January 12, 1943, following dinner.

The program for the evening consisted of a paper by Dr. Walter P. Gardner of Anoka entitled "Pulmonary Tuberculosis at the Anoka, Minnesota, State Hospital, 1934-1941."

Officers elected for the coming year are: President, Alfred W. Adson, M.D., Anoka; vice president, Walter P. Gardner, M.D., Anoka; secretary-treasurer, Royal C. Gray, M.D., Minneapolis.

WINONA COUNTY MEDICAL SOCIETY

Dentists of Winona County were guests of members of the Winona County Medical Society at the annual meeting held in Winona, Monday evening, January 4, 1943, when Dr. E. D. Risser presented a paper on "Blood Banks and Blood Transfusions," covering special studies he recently completed in an extension course at the University of Minnesota.

Officers elected for the coming year included: President, E. D. Risser, M.D.; vice president, Victor Bruder, M.D.; secretary, A. E. Meinert, M.D.; treasurer, R. H.

Of General Interest

Dr. Paul B. Monroe, formerly of Two Harbors, has established his practice at Cloquet, where he has joined the staff of the Raiter Hospital.

* * *

Dr. R. C. Radabaugh of Hastings has received notification of his acceptance to fellowship in the American College of Surgeons.

* * *

Dr. and Mrs. Demeter Kalinoff of Stillwater and daughter, Helen, left recently for an extended stay in Arizona, or New Mexico or wherever the climate best suits them. They are traveling by automobile.

* * *

At the annual meeting of the staff of St. Luke's Hospital, Saint Paul, on Friday, January 15, 1943, Dr. A. P. Gruenhagen was re-elected chief-of-staff and Dr. D. L. McCain was elected secretary.

* * *

Dr. W. R. Humphrey, Stillwater, returned in December from a five weeks' visit in the East, principally in Virginia, his home state. Returning, he attended the Interstate Post-Graduate Assembly of North America meeting in Chicago.

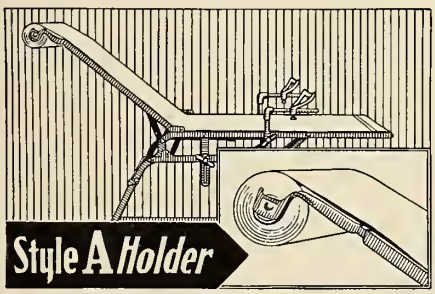
Dr. J. Gordon Cole of Redwood Falls has accepted a position on the staff of a New York hospital for the duration of the war. He expects to return to his practice in Redwood Falls when his services are no longer needed in the East.

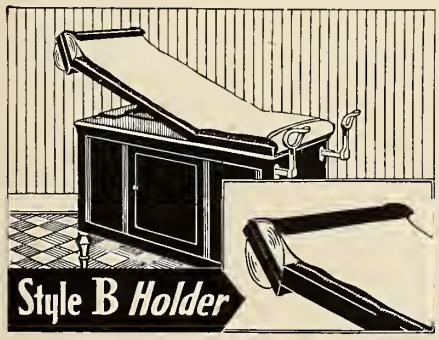
* * *

Dr. Cecil J. Watson, professor of medicine and chief of the division of internal medicine, Medical School, University of Minnesota, in December delivered three addresses before the Porto Rico Medical Society. He spoke in Ponce, P. R., on the anemias, hemoglobin metabolism and bile pigments.

* * *

The Foundation Prize of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons consisting of $150.00 is open to interns, residents or graduate students in obstetrics, gynecology or abdominal surgery and to physicians practicing or teaching this specialty. Manuscripts are limited to 5,000 words and should be submitted by June 1, 1943, to Dr. James R. Bloss, secretary, 418 Eleventh Street, Huntington, West Virginia.





SOLAREUM
PAPER TABLE SHEETING

The Modern, Economical Way
For Progressive Physicians

Ready at the head of your examining table is a continuous, instant supply of SOLAREUM sheeting. Here, in a sanitary holder that is especially designed to fit any style of table you might have in your office, you have about 700 to 1,000 lineal feet available, quick as a flash, whenever you need it.

SOLAREUM sheeting is purposely made for efficient service in the modern physician's office. It is conveniently, quickly spread over your table, and is pleasant to lie on. There is no crackling noise, no cold feeling, no discomfort to disturb the nervous patient.

SOLAREUM sheeting is inexpensive, saving nearly all or much of the laundry cost, according to the nature of your practice. It gives you a clean sheet for each patient at minimum cost. Distributed over an entire year this saving is well worth considering.

BROWN & DAY, INC.
Saint Paul, Minnesota



Dr. R. V. Williams of Rushford retired from practice the latter part of December and announced that his associate, Dr. I. Grant Davis, will continue the practice of medicine in the community. Dr. Davis recently completed a special course in refraction at the Illinois Eye and Ear Infirmary at the University of Illinois and will take care of the refraction work formerly done by Dr. Williams.

* * *

Dr. Ernest M. Hammes, chairman of the Medical Testimony Committee of the Minnesota State Medical Association, addressed the joint meeting of the Congress on Industrial Health and the Congress on Legislation of the American Medical Association at their meeting in Chicago, January 11 to 13, 1943, on the subject of the Control of Medical Testimony—The Minnesota Plan.

* * *

During the current quarter 140 medical and dental officers of the Army, Navy, Public Health Service and the Air Forces are assigned through the Surgeon Generals' offices and the various Service Commands for training under the auspices of the Mayo Foundation for Medical Education and Research. The fields in which such training is offered are anesthesiology, aviation medicine, general surgery and surgical specialties, internal medicine and medical specialties, maxillofacial surgery, neurologic surgery, physical medicine, roentgenology and thoracic surgery. Officers are assigned for periods of training varying from six to twelve weeks.

* * *

A portable orthopedic fracture bed will be purchased with funds to be raised through the efforts of the Wells Junior Chamber of Commerce, according to an announcement made last December. The bed will be available for use of residents in the following towns and surrounding communities: Wells, Brycelin, Delavan, Easton, Frost, Kiester, Walters, Conger, Mansfield, Manchester, Armstrong, Alden, Hartland, Freeborn, Minnesota Lake, Mapleton, Waldorf, Matawan, and New Richland. The bed will be readily available to any physician in the listed areas, should an emergency arise.

* * *

Creation of an additional home for the feebleminded "at the earliest possible moment," due to the tremendous waiting list of patients badly in need of removal from their present surroundings, was recommended by Dr. D. E. McBroom, director of the mental health unit of the division of public institutions, in his report to Carl H. Swanson, public institutions director, who submitted his biennial report to Gov. Harold E. Stassen and the state legislature in January.

"The feebleminded problem is perhaps the biggest individual problem the state has to meet as we have a long waiting list and so many patients are creating a situation so bad they should be removed from their surroundings at once," Dr. McBroom urged.

Hospital News

Dr. George E. Penn was elected president of the staff of the Immanuel Hospital, Mankato, at the meeting of staff physicians in January. Other officers chosen at the meeting were Dr. A. F. Kemp, vice president, and Dr. J. A. Butzer, secretary-treasurer.

* * *

Dr. P. G. Boman is the new chief of staff of the Miller Memorial Hospital at Duluth. He succeeds Dr. Carl O. Kohlbry. Other officers are Dr. E. L. Armstrong, vice chief of staff; and Dr. E. E. Barrett, secretary-treasurer. Dr. Kohlbry and Dr. W. J. Ryan were named to the Executive Committee.

* * *

Dr. Jean J. Darius of Lame Deer, Montana, began his duties as senior physician at the Indian Hospital in Bemidji, late in December. He succeeds Dr. James Klock, who recently resigned to take up duties elsewhere.

* * *

St. Mary's Hospital, Detroit Lakes, was recently the recipient of an oxygen therapy machine donated by the American Legion of Detroit Lakes.

* * *

Mrs. Alma Grothe is the new superintendent at St. Francis Hospital, Hastings, succeeding Mrs. Wallace H. Erickson, resigned. Mrs. Grothe is a graduate of St. Luke's Hospital, Fargo, North Dakota. Prior to taking the position at St. Luke's Hospital, she was instructress of nurses at Hillcrest, Minneapolis, for three years and superintendent of a hospital in Sioux Falls, South Dakota, for some time.

* * *

Physicians in Military Service

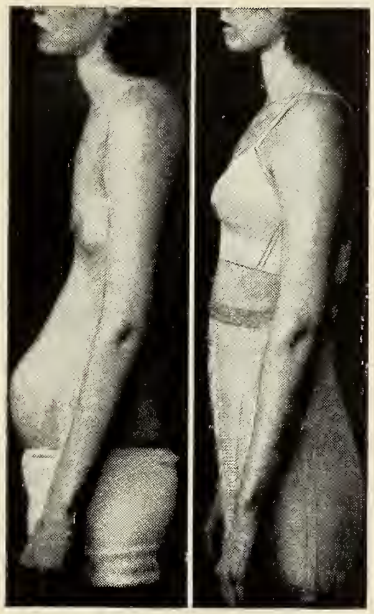
Dr. Harold S. Diehl, dean of the Medical School, has recently received word of military honors bestowed on three medical officers who are graduates of Minnesota.

The Distinguished Service Medal of the Army was given to Col. James O. Gillespie of the Class of 1925 for work in developing hospitals in Bataan during its siege. Col. Gillespie is now a prisoner in the Philippines.

Captain William W. Moir, Class of 1938, received the Distinguished Service Cross for continuing to direct treatment of his men after he had been wounded when a transport plane in which he was traveling was shot down the morning of Nov. 8. "During the attack in the air and ensuing strafing of the ground, Moir distinguished himself by extraordinary heroism," his citation concluded.

Lieut. John H. Peterson of Duluth, a graduate of the University of Minnesota Medical School in 1932, was awarded a Silver Star medal recently, according to a Navy announcement. Stationed on the destroyer *Hammann* when it was sunk with the aircraft carrier *Yorktown* off the Midway Islands some months ago, Lieutenant Peterson struggled to a lifeboat after the destroyer was sunk and with the help of a torpedoman picked up wounded seamen. Although both were wounded, they made several rescue trips to take wounded men to a nearby destroyer and rendered medical aid to the wounded for three days to the point of exhaustion.

Patients with Long-Standing Ptosis



A B

Are Grateful For Relief Obtained By Individually Designed SPENCER SUPPORT

A: *Patient with extreme case of enteroptosis. Probably has movable kidney, also.*

B: *Same patient in the Spencer that was designed especially for her. Note support given — and improvement in posture.*

A large number of doctors have remarked the immediate favorable reaction of patients with long-standing ptosis to a Spencer Support. This is because the Spencer has been designed especially for patient *after* a study of patient's posture habits has been made. Thus our designers are enabled to create a support that will improve posture.

A Spencer Support gently lifts sagging organs, while allowing freedom at upper abdomen. This, plus posture improvement, aids digestion, elimination and improves circulation of blood through abdomen. Appetite usually improves. The patient's improved posture induces better breathing, a feeling of well-being and a happier outlook.

Every Spencer is individually designed for patient, of non-elastic material. Hence, the support it provides is constant, and the Spencer can be—and IS—guaranteed NEVER to lose its shape. (Spencers have never been made to *stretch to fit;* they have always been *designed to fit.*) Why prescribe a support that soon loses its shape and becomes useless before worn out? Spencers are light, flexible, durable, easily laundered.

For service look in telephone book under "Spencer Corsetiere" or write direct to us.

SPENCER *INDIVIDUALLY DESIGNED*

Abdominal, Back and Breast Supports

SPENCER, INCORPORATED,
137 Derby Ave., New Haven, Conn.
In Canada: Rock Island, Quebec.
In England: Spencer (Banbury) Ltd., Banbury, Oxon.

Please send me booklet, "How Spencer Supports Aid the Doctor's Treatment."

May We Send You Booklet?

.....M.D

Address.....

A DIAPER SERVICE

you can recommend with Complete Confidence

NATIONAL INSTITUTE + DIAPER SERVICES + MEMBER

Our advertising accepted in the Journal of the American Medical Association

Baby's Diaper Service Company

2741 HENNEPIN AVENUE

St. Paul Midway 4682 | Minnetonka Enterprise 3627 | Minneapolis Locust 4288

86c out of each $1.00 gross income used for members benefit

PHYSICIANS CASUALTY ASSOCIATION
PHYSICIANS HEALTH ASSOCIATION

Hospital, Accident, Sickness

INSURANCE

For ethical practitioners exclusively

(57,000 Policies in Force)

LIBERAL HOSPITAL EXPENSE COVERAGE	For $10.00 per year
$5,000.00 ACCIDENTAL DEATH $25.00 weekly indemnity, accident and sickness	For $32.00 per year
$10,000.00 ACCIDENTAL DEATH $50.00 weekly indemnity, accident and sickness	For $64.00 per year
$15,000.00 ACCIDENTAL DEATH $75.00 weekly indemnity, accident and sickness	For $96.00 per year

41 years under the same management

$2,418,000.00 INVESTED ASSETS

$11,350,000.00 PAID FOR CLAIMS

$200,000 deposited with State of Nebraska for protection of our members.

Disability need not be incurred in line of duty—benefits from the beginning day of disability.

Send for applications, Doctor, to

400 First National Bank Building Omaha, Nebraska

Dr. W. F. Schamber of New York Mills left for Miami, Florida, in January to report for military duty.

Dr. Conrad Karleen of Tracy, associated with Dr. W. H. Valentine and the Tracy Hospital for the past two years, has received his commission as captain in the medical corps and is now in Springfield, Missouri, where he is stationed at O'Reilly General Hospital, serving in the capacity of surgeon.

Dr. Bernard Karleen of Balaton, a brother of Dr. Conrad Karleen, has entered the Army Medical Air Corps at Miami, Florida.

* * *

News of Minneapolis physicians engaged in war service contains the following items:

Dr. George Bergh has been promoted to the rank of major, according to information received by his parents, Dr. and Mrs. L. N. Bergh of Montevideo. Dr. Bergh is serving with the American Expeditionary Forces overseas.

Captain Henry H. Michel has been ordered to duty with the Army Air Force at Miami Beach, Florida.

First Lieutenant Fabian John McCaffrey is under orders to report to Army Air Force station at Miami Beach early in February.

Lieutenant Commander John F. Pohl has been ordered to report to the National Naval Medical Center, Bethesda, Maryland, February 15.

Lieutenant Commander Lawrence M. Larson who has been commanding officer of the Naval Hospital, Wold Chamberlain Field, is now en route to some undisclosed point in the South Pacific to serve as Flight Surgeon with a Marine aviation unit.

Lieutenant Commander Hugo E. Miller is receiving congratulations on his recent promotion. He has been relieved from duty with recruiting and assigned to the Naval Hospital, Seattle.

Captain William W. Moir, Jr., DSC, son of the late W. W. Moir, has received the Order of the Purple Heart. He was wounded and decorated for gallantry in action in North Africa.

Major Donald W. Pollard has been assigned to administrative work at the Kennedy General Hospital, Memphis. This is a new hospital which is being expanded rapidly.

Major William J. Noonan has been transferred from Fort Leonard Wood to the 126th Station Hospital, Camp Grube, Oklahoma.

Captain Benjamin J. Palen is now taking graduate work in surgery at Harvard Medical School, following which he will return to the Station Hospital, AAF Bombardier School, Big Spring, Texas.

Captain Harold G. Benjamin is reported to have been sent to an overseas theater of war.

Lieutenant Maynard C. Nelson is reported en route to a post in the South Pacific.

Major Reuben Berman has been transferred to the 14th Bomb Wing, stationed at McDill Field, Florida.

INFLUENZA—PNEUMONIA—ENCEPHALITIS
THE STATE BOARD ASKS YOUR AID

Influenza—Two types of influenza are known at present, "A" and "B". The distribution and extent of infection with these two viruses may be determined through your aid.

Pneumonia.—Recently there has been much interest in so-called atypical or virus pneumonias. Very little is known of their etiology. The Division of Preventable Diseases wishes to study these diseases and asks your aid. The Rockefeller Foundation for some years has aided the Division of Preventable Diseases in the study of Influenza and related diseases. But the expense and the time-consuming technique necessary have restricted the studies chiefly to institutional outbreaks.

New serological techniques have been devised that are rapid and inexpensive. Neutralization tests on sera to determine a rise in the antibody content of convalescent serum as compared with serum taken during the first two or three days of illness will establish diagnosis.

Mailing outfits will be supplied, on request, by the Division of Preventable Diseases. The first serum specimen is to be taken on the first two or three days. The sera for comparison of antibody content in suspected influenza ("A" or "B") between the tenth and fourteenth day after onset.

Encephalitis.—In suspected encephalitis of the equine and St. Louis types, the later specimens for comparison of antibody content should be taken two to six weeks after onset, and in lymphocytic choriomeningitis, from the second to the fourth month after onset.

Health officers and physicians in contact with outbreaks of this character and physicians who see suspected cases, will please coöperate.

MENINGITIS MORE FREQUENT

Many more cases of meningococcus meningitis are being reported by state health officers to the U. S. Public Health Service each week than have been reported at this season any time in the last five years.

During the year just ended (1942), there were 3,774 cases reported altogether. This is a larger total yearly figure than any year since 1937, when there were 5,390 cases.

At present, and for some time past, the cases have been confined to the extreme eastern part of the country and the Pacific coast.—*Science News Letter,* January 30, 1943.

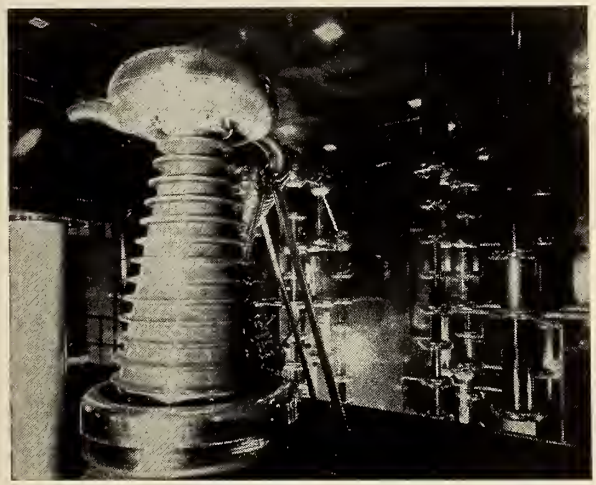
CLASSIFIED ADVERTISING

LABORATORY TECHNICIAN, excellent training, three years' hospital and office experience, wants position part or full time. Twin Cities preferred. Address D-42, care MINNESOTA MEDICINE, or telephone LOcust 9264.

* * *

EXPERIENCED LABORATORY and x-ray technician desires position in doctor's office in Minneapolis or vicinity. Available February first. Address D-41, care MINNESOTA MEDICINE.

Radiation Therapy Institute



Upper End of Tube and Million Volt Generator

of Saint Paul

CHARLES T. MILLER HOSPITAL

Facilities for Radium and Roentgen Therapy, Including Million Volt Constant Potential Installation of Most Advanced Design.

You are cordially invited to visit the Radiation Therapy Institute and inspect its facilities

Edward Schons, M.D., Director J. P. Medelman, M.D., Associate Director

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

MENTAL ILLNESS: A GUIDE FOR THE FAMILY. Edith M. Stern, with the collaboration of Samuel W. Hamilton, M.D. 134 pages. Price, $1.00, cloth. New York: The Commonwealth Fund, 1942.

THE EYE MANIFESTATIONS OF INTERNAL DISEASES. I. C. Tassman, M.D. 542 pages. Illus. Price, $9.50. St. Louis; C. V. Mosby Co., 1942.

This is the first book of this character since that published by Foster Moore ten years ago. A correlation is made between the eye manifestations and the other medical aspects of the internal diseases by providing a very detailed description of the ocular findings. The first few chapters are devoted to a description of the normal and abnormal structures of the eye, together with a description of the method used in making a complete ocular examination of the patient, and a listing of the general causes of eye manifestations.

The remainder of the book has to do with congenital and hereditary eye manifestations; infections and infectious diseases; tuberculosis; virus infections; fungus infections; ocular parasites and parasitic infections; focal infections; drug and chemical intoxications; diseases of the cardio-vascular system; diseases of the blood; diseases of menstruation and pregnancy; diseases of the endocrine glands and metabolism; avitaminosis and intracranial tumors; diseases of the skin; diseases of bones of the skull.

Obviously, this is a rather complete presentation dealing with systemic lesions. The clinical picture is given first and this is followed by the ocular manifestations. This book, I think, is suitable for the teaching of the student who should be impressed with the relationship of ophthalmologic diseases to general medical conditions.

T. J. EDWARDS, M.D.

THE ANSWER IS—YOUR NERVES. Arnold S. Jackson, M.D. 1942. 200 pages. Price $2.00. Madison, Wisconsin: Jackson Publications.

Individuals who suffer from functional disturbance constitute the greater part of the practice of most physicians. Most of these patients in the stress of modern living and particularly during this period of world strife are beset by worries and fears of various sorts and are lacking in a philosophical attitude toward life and in religious faith. They haven't learned how to live.

For this large group of patients this volume has been written. It contains some medical information which should be of value to the nervous patient in aiding him or her to understand some of the dis-

WAUKESHA SPRINGS SANITARIUM



BUILDING ABSOLUTELY FIREPROOF

FOR THE CARE AND TREATMENT OF

NERVOUS DISEASES

BYRON M. CAPLES, M. D., Medical Director
FLOYD W. APLIN, M. D.
WAUKESHA, WIS.

DANIELSON MEDICAL ARTS PHARMACY, INC.

PHONES:
ATLANTIC 3317
ATLANTIC 3318

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

HOURS:
WEEK DAYS—8 to 7
SUN. AND HOL.—10 TO 1

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.
414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.
INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS
MAIN 2494

turbances which account for nervous symptoms and does not ignore the importance of seeking medical advice instead of worrying.

The pages contain much philosophical advice and many hints as to hobbies and outside interests which make life so much more interesting and counteract the causes of "nerves." The chapter by the Reverend Edwin O. Kennedy of Madison on Religion and Nerves stresses the value of faith in a loving God, Bible scripture and church attendance in combating worry and nerves and is a valuable contribution to the volume.

Physicians too often neglect the opportunity to be of greatest assistance to these patients who suffer from just nerves. For this reason the reading of "The Answer IS—Your Nerves" would be of value to physician or surgeon. And the loaning out to patients of one or more copies might well fulfill one of the purposes of the book—to aid the doctor in treating his nervous patients.

C. B. D.

THE BLOOD BANK AND THE TECHNIQUE AND THERAPEUTICS OF TRANSFUSIONS. R. A. Kilduffe and Michael DeBakey. 558 pages. Illus. Price $7.50. St. Louis: C. V. Mosby Co., 1942.

The recent work done in the field of blood transfusion has reached tremendous heights. Of course the present war has stimulated this branch of therapy and the average physician has had difficulty in keeping abreast of the topic. This book should be an answer to his problem. It is concise but still retains a completeness that leaves the reader with a sense of "knowledge security."

The principles of transfusion are adequately discussed and the practical aspects are satisfactorily described. The diagrams and illustrations enable the reader to easily grasp the expressed idea with little effort.

The discussion of shock and its treatment is especially well done by the authors.

The book is not one that can be read hurriedly, because in doing so, much valuable information would be missed.

Joseph M. Ryan, M.D.

THE MIND AND ITS DISORDERS. James N. Brawner, M.D., Medical Superintendent, Brawner's Sanitarium, Smyrna, Ga. Cloth. Price $3.50. Pp. 228. Atlanta, Ga.: Walter W. Brown Publishing Co., 1942.

Dr. Brawner, in the preface to his volume, "The Mind and Its Disorders," states that he is writing primarily for the benefit of the general practitioner, and that his intention is to present the subject clearly, briefly, and in language as simple as the subject permits. To the reviewer, it would seem that he had been too successful in accomplishing this purpose. The work covers a wide variety of neuropsychiatric disorders, too many to be described adequately in the brief space he allots to each condition.

The book is simply written and easily read. The reviewer feels that its style and simplified form may convey to the reader an underestimation of the impor-

This New Book Will Save Consultation Time

THE ANSWER IS . . . YOUR NERVES

by

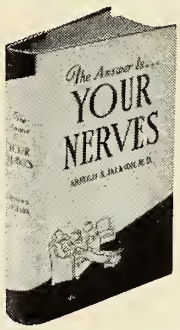
Arnold S. Jackson, M.D., F.A.C.S.

"A book that every doctor should have on his waiting-room table."

CONCISE, PRACTICAL, TIMELY and an invaluable aid in the treatment of FUNCTIONAL NERVOUSNESS.

Every doctor and medical student, as well as the layman, will find in this book the answer to the most common of medical problems today.

5" x 7¾". 200 pages. Cloth bound. Illustrated. 1st printing, July, 1942. 2nd printing, Dec., 1942.



". . . a light but frontal attack on a major medical problem and should help those who read it seriously."—Journal of the American Medical Association.

"An exceedingly practical manual that every physician should have in his possession. It emphasizes a point which has been sadly neglected in medical education in many institutions in the past. The relationship of the mind to many diseases is just being realized."

Eben J. Carey, M.D., Dean
Marquette University
School of Medicine

A VALUABLE TIME-SAVER AND A REAL HELP TO THE PATIENT!

KILGORE PRINTING CO.,
117 E. Mifflin St., Madison, Wis.
Please send a copy of Arnold S. Jackson's book "The Answer Is . . . YOUR NERVES." $2.00 postpaid.
Remittance enclosed.

Name .....
Street .....
City ..... State.....

TASTE!

GLENWOOD INGLEWOOD NATURAL* OR DISTILLED SPRING WATER



for home and office

GENEVA 4351

*Naturally Mineralized, Naturally Healthful

tance and extent of care psychiatric cases require. The paragraphs on etiology are over-simplified and are apt to leave the impression that the causes are well defined and understood. The sections on treatment are brief. Symptomatic treatment is suggested in most instances and the basic principles of treatment are briefly outlined, but little actual aid or advice for handling a neuropsychiatric case is given. The book is especially weak as far as suggested technique and principles of psychotherapy are concerned. The paragraphs on symptoms are more complete and the diagnosis and differential diagnosis are adequately handled in most instances.

For a busy general practitioner, and one not particularly interested in statistics and classification, Dr. Brawner has presented his material in what seems to be an understandable and logical manner. At the end of the various sections in the book is a bibliography, which in places is very complete. This greatly increases the value of the book for those interested in pursuing the subject further.

Throughout the entire book, the author freely states his own personal experiences, opinions, and conclusions. Many of his speculations would certainly be open to question and all have not, as yet, been verified by research. He does, however, give due recognition to others who have different ideas on the subject.

Dr. Brawner is to be commended for his able handling of the interrelationship between internal medicine and psychiatry. He brings out this connection logically and clearly through the entire book. The effect of emotions on bodily functions, and vice versa, is briefly outlined, explained and well organized. This particular section, Part I—The Mind as Related to Cerebral Structures and Functions, will give the general practitioner a good basic introduction to the subject and will help to orient him, should he desire to seek more complete discussions on the subject elsewhere.

If the book is considered by the reader as a stepping stone to more complete works on the subject of psychiatry, it is well worth reading. The average physician, however, will find it does not answer his questions nor solve many of the problems that arise in his care of a neuropsychiatric patient. Dr. Brawner's book, because of its simple terms and brevity, could be used to advantage as a reference book for nurses in their preliminary orientation course in psychiatry. Even in this use, it would have to be supplemented by other books which deal with psychiatric nursing technique.

PHILIP K. ARZT.

INDUSTRIAL HEALTH

(Continued from page 204)

placement examination is a device to select only perfect human material to the elimination of all applicants who exhibit any physical defects. Such is, indeed, not the case. If it were, not only would the social loss be great, but the pre-placement examination would lend itself to the perpetration of a cruel and inhuman discrimination.

Correction of Remediable Defects

"There are functions of the pre-placement examination, furthermore, which are in a sense incidental to the main purpose for which it is made. One of these is recognition of remediable defects. It is good practice to acquaint the applicant with these defects and then to urge the immediate correction of certain defects either as a condition of employment or as a condition of acceptance for an insurance program."

Tendency Is to Employ Disabled

"The pre-placement examination is not given for the purpose of rejecting applicants," he emphasized again in conclusion. A few are unemployable because of infectious tuberculous or luetic disease, for instance. But the whole question is one of the man and the specific job he is to do and rejection for one given position does not necessarily mean that a man is unemployable. Aside from this emergency, the tendency of industry is rightly to employ men with disabilities which are not potential hazards to themselves or to fellow workers."



VOCATIONAL HOSPITAL

. . . An integral part of the Miller Vocational High School offers two special features—Patients receive a maximum of personal attention from student practical nurses—All food is prepared under the direction of a qualified dietitian. Patients remain under the care of their own physicians.

Director of Nurses—M. H. WOLTMAN, R.N., B.S.
Superintendent & Dietitian—H. B. BROWN, B.S.

Physicians may secure services of Vocational nurses by calling Nurses Headquarters and asking for a Vocational Nurse

Bridgeport 2281

5511 South Lyndale - - Minneapolis

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.
414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.
INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS
MAIN 2494

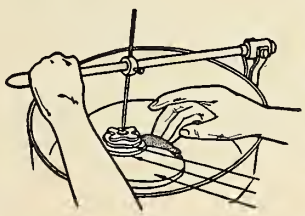
SAVE TIME!
TRY DAHL'S
Biologicals — Dressings
Pharmaceuticals — Surgical Instruments
Hypodermic Medications
Day and Night Service
Joseph E. Dahl Co.
Incorporated
ATlantic 5445 — 82 So. 9th St., Mpls.

Radiological and Clinical
Assistance to Physicians
in this territory
MURPHY LABORATORIES
Minneapolis: 612 Wesley Temple Bldg. - - At. 4786
St. Paul: 348 Hamm Bldg. - - - - - - - Ce. 7125
If no answer, call - - - - - - - - - - Ne. 1291

Send us your slow collection items.
All accounts made by personal calls.
We specialize in Medical and Dental Accounts.
Bonded and Licensed Under Minnesota State Laws
Northwestern Adjustment Co.
518 Bremer Arcade Bldg.
St. Paul — Minnesota

Hall & Anderson
PRESCRIPTION PHARMACY
BIOLOGICALS
PHYSICIANS' SUPPLIES
SAINT PAUL, MINN.
LOWRY MEDICAL ARTS BUILDING
TELEPHONE: CEDAR 2735

CHECKING SERVICE . . .
The American **ECONOMY** *Way*
THE AMERICAN NATIONAL BANK offers a NEW PLAN in Personal Checking Accounts.
This service is offered to those who would like to open a checking account but find it inconvenient to maintain the balance required for regular checking accounts. A charge of 7c is made for each check paid, also a nominal charge on deposits.
Open an account for any amount.
THE AMERICAN NATIONAL BANK
BREMER ARCADE — 7TH AT ROBERT — *Free Parking* — *Member Federal Deposit Insurance Corporation*
Cedar 0573

UNUSUAL LENS GRINDING

CATARACT, MYO-THIN and other difficult and complicated lenses are ground to extreme thinness and accuracy by our expert workmen.
ARTHUR F. WILLIAMS
SAINT PAUL
MINNESOTA

Save 25 to 40 Per Cent
Druggists' Mutual Insurance Company
OF IOWA, ALGONA, IOWA
Fire - Tornado - Automobile Insurance
Prompt Loss Service
Minneapolis Branch—S. E. STRUBLE, 835 Palace Bldg.
Home Office—Algona, Iowa



Three of the units

Glenwood Hills Hospitals

3501 Golden Valley Road
Hyland Station
Route Seven

Operated In Connection with Homewood Hospital

Plymouth at Penn Avenue, Minneapolis

FOR NERVOUS DISORDERS

A modern hospital for nervous disorders, built on the cottage plan. The buildings are located on elevated land, affording beautiful views on all sides. Glenwood Hills Hospitals have all the advantages of rural surroundings, and are still only a few minutes by automobile from the Minneapolis loop.

AN INVITATION

The facilities of these institutions are available for all reputable members of the medical profession.



The Birches Sanitarium, Inc.

2391 Woodland Avenue

Duluth, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Psychiatrists in Charge

L. R. Gowan, M.D. A. S. Nissen, M.D.



For Victory

Buy War Bonds and Stamps



Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 **March, 1943** **No. 3**

Contents

THE DIAGNOSIS OF CORNEAL LESIONS.
F. H. Haessler, M.D., Milwaukee, Wisconsin.... 243

EUSTACHIAN TUBE FUNCTION AND DEAFNESS.
J. R. Lindsay, M.D., Chicago, Illinois..... 250

ACUTE SUPPURATIVE OTITIS MEDIA—A RECONSIDERATION.
Charles E. Connor, M.D., Saint Paul, Minnesota 257

STAPHYLOCOCCIC CONJUNCTIVITIS.
T. R. Fritsche, M.D., New Ulm, Minnesota..... 263

VISUAL MALINGERING.
A. G. Athens, M.D., Duluth, Minnesota..... 266

SPONTANEOUS PARALYSIS OF THE SEVENTH AND EIGHTH NERVES, WITH RECOVERY.
Orien B. Patch, M.D., Duluth, Minnesota..... 270

LOSS OF CILIA IN THE RESPIRATORY TRACT AND ITS RELATION TO DEATH FROM RESPIRATORY DISEASE.
A. C. Hilding, M.D., Duluth Minnesota..... 272

THE BENEFICIAL EFFECT OF UREA IN TOPICAL SULFONAMIDE THERAPY.
Ernest A. Strakosch, M.D., M.S., and *William G. Clark, Ph.D.*, Minneapolis, Minnesota..... 276

TREATMENT OF CRANIOCEREBRAL INJURIES IN MODERN WARFARE.
George S. Baker, M.D., and *Alfred W. Adson, M.D.*, Rochester, Minnesota..... 282

CLINICAL-PATHOLOGICAL CONFERENCE:
Presentation of a Case.
A. J. Hertzog, M.D., and *S. V. Lofsness, M.D.* 288

HISTORY OF MEDICINE IN MINNESOTA:
History of Medicine in Dodge County.
James Eckman, Rochester, Minnesota, and *Charles E. Bigelow, M.D.*, Dodge Center, Minnesota (Continued from February issue) 290

PRESIDENT'S LETTER 295

EDITORIAL:
The Diagnosis of Multiple Myelomata..... 296
The Red Cross..... 297
Capitalism Desirable 297

MEDICAL ECONOMICS:
Action in Chicago..... 299
New Jersey Plan..... 300
In the Hopper..... 300
Minnesota State Board of Medical Examiners.. 301

INDUSTRIAL HEALTH:
Industrial Absenteeism 303

WOMAN'S AUXILIARY 304

MINNESOTA ACADEMY OF MEDICINE:
Meeting of December 9, 1942..... 305
Intensive Chemotherapy in Early Syphilis.
Francis W. Lynch, M.D., Saint Paul, Minnesota 305

REPORTS AND ANNOUNCEMENTS 310

BOOK REVIEWS 313

OF GENERAL INTEREST 314

Contents of MINNESOTA MEDICINE copyrighted by Minnesota State Medical Association, 1943

Entered at the Post Office in Minneapolis as second class mail matter. Accepted for mailing at the special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 13, 1918.

MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL ASSOCIATION

Published by the Association under the direction of its Editing and Publishing Committee

EDITING AND PUBLISHING COMMITTEE

E. M. HAMMES, Saint Paul
PHILIP F. DONOHUE, Saint Paul
H. W. MEYERDING, Rochester
H. A. ROUST, Montevideo
B. O. MORK, JR., Worthington
A. H. WELLS, Duluth
O. W. ROWE, Duluth
T. A. PEPPARD, Minneapolis
HENRY L. ULRICH, Minneapolis
C. L. OPPEGAARD, Crookston

EDITORIAL STAFF

CARL B. DRAKE, Saint Paul, Editor
GEORGE EARL, Saint Paul, Associate Editor
HENRY L. ULRICH, Minneapolis, Associate Editor

BUSINESS MANAGER

J. R. BRUCE

Annual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian Subscriptions—$3.50.

The right is reserved to reject material submitted for editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

Classified advertising—five cents a word; minimum charge, $1.00. Remittance should accompany order.

Display advertising rates on request.

Address all communications to Minnesota Medicine, 2642 University Avenue, Saint Paul, or National Bldg., Minneapolis. Telephone Nestor 2641.

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN



MAIN BUILDING—ONE OF THE 5 UNITS IN "COTTAGE PLAN"

A Modern Private Sanitarium for the Diagnosis, Care and Treatment of Nervous, Mental and Medical Cases

Located on beautiful Lake St. Croix, eighteen miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Milk, cream and butter from our own herd of Tuberculin-tested Registered Guernsey Cows. Inspection and coöperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

CONSULTING NEURO-PSYCHIATRISTS

Hewitt B. Hannah, M.D.
Joel C. Hultkrans, M.D.
511 Medical Arts Building
Minneapolis, Minnesota
Tel. MAin 4672

RESIDENT PHYSICIAN
Howard J. Laney, M.D.
Prescott, Wisconsin
Tel. 39

SUPERINTENDENT
Ella M. Mackie
Prescott, Wisconsin
Tel. 69



Provide quick

sustained relief from nasal congestion, without appreciable nervous excitation, by prescribing

Neo-Synephrine

Hydrochloride

(laevo—alpha—hydroxy—beta—methyl—amino—3 hydroxy ethylbenzene hydrochloride)



ACCEPTED
AMERICAN MEDICAL ASSN
Council on Pharmacy and Chemistry

Available in a ¼% or 1% solution in 1-oz. bottles for dropper or spray; and as a ½% jelly in collapsible tube with applicator.

Frederick Stearns & Company

Since 1855... ESSENTIALS OF THE PHYSICIAN'S ARMAMENTARIUM

NEW YORK KANSAS CITY **DETROIT, MICHIGAN** SAN FRANCISCO WINDSOR, ONTARIO
SYDNEY, AUSTRALIA AUCKLAND, NEW ZEALAND



When depression accompanies more fundamental pathology

In many patients, depression may occur as an accompaniment of some more fundamental pathology, either organic or psychogenic. In such cases, the physician should bear in mind that, while Benzedrine Sulfate will not affect the underlying condition, its stimulatory effects may help to alleviate the concomitant depression which so often interferes with the management of the case.

Benzedrine Sulfate Tablets

Brand of amphetamine sulfate

Benzedrine Sulfate is primarily useful in depressions characterized by apathy and psychomotor retardation, but is contraindicated in patients manifesting anxiety, hyperexcitability, or restlessness.

The use of Benzedrine Sulfate by normals should not be permitted; it should always be administered under the careful supervision of a physician; and depressive p ychopathic cases should be institutionalized.

In treating depressed patients with Benzedrine Sulfate, the physician should bear in mind that any drug which produces pleasant or euphoric effects may prove to be habit forming—especially in unstable or neurotic individuals.

SMITH, KLINE & FRENCH LABORATORIES, PHILADELPHIA, PA.

Note to an overworked doctor



BIOLAC is a complete liquid infant formula which saves you valuable time because there are no extra ingredients to calculate.

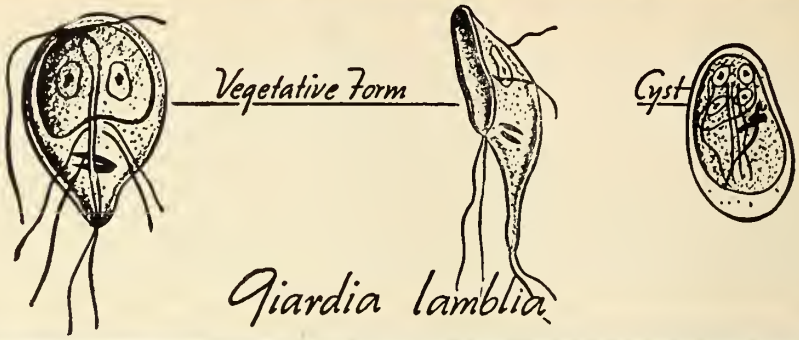
Biolac provides completely for all nutritional needs of young infants except vitamin C.

Prescribing Biolac reduces the possibility of errors or contamination in formula preparation since it requires simply dilution with boiled water as you direct.

NO LACK IN BIOLAC

Borden's complete infant formula

● *Biolac is prepared from whole milk, skim milk, lactose, Vitamin B_1, concentrate of Vitamins A and D from cod liver oil, and ferric citrate. It is evaporated, homogenized, and* sterilized. *For professional information, write Borden's Prescription Products Division, 350 Madison Avenue, New York City.*



GIARDIASIS

. . . Although evidence for the pathogenic nature of Giardia lamblia is not conclusive, this microorganism may possibly be the cause of diarrhea, abdominal pain and other symptoms of the clinical picture commonly referred to as giardiasis.

It has recently been demonstrated that Giardia lamblia can be eradicated from the intestinal tract with remarkable promptness by the administration of Atabrine Dihydrochloride.

The usual dose of Atabrine Dihydrochloride is 0.1 Gm. three times daily for five days.

ACCEPTED AMERICA MEDICAL ASSN. Council on Pharmacy and Chemistry

ATABRINE

Reg. U. S. Pat. Off. & Canada

DIHYDROCHLORIDE

Brand of Quinacrine Hydrochloride

Chemotherapeutic Specific Against Malaria

ARMY E NAVY

This cherished symbol of distinguished service to our Country waves from the Winthrop flagstaff.

WINTHROP CHEMICAL COMPANY, INC.

Pharmaceuticals of merit for the physician

NEW YORK, N. Y. **WINDSOR, ONT.**

Give the cigarette they prefer to get*



IT'S EASY to understand why cigarettes are the preferred gift in the armed services. But did you know that among them the best-liked brand* of cigarette is Camel? Camel is the popular choice of millions and millions of smokers for its finer flavor and superior mildness.

Send Camels, the service man's favorite, to those friends or relatives who are fighting our battles —fighting them efficiently and unselfishly. Your thoughtfulness will be appreciated.

Tobacco stores feature Camels by the carton. See or telephone your dealer today.

Remember, you can *still* send Camels to Army personnel in the U. S., and to men in the Navy, Marines, or Coast Guard *wherever they are*. The Post Office rule against mailing packages applies only to those sent to the overseas Army.

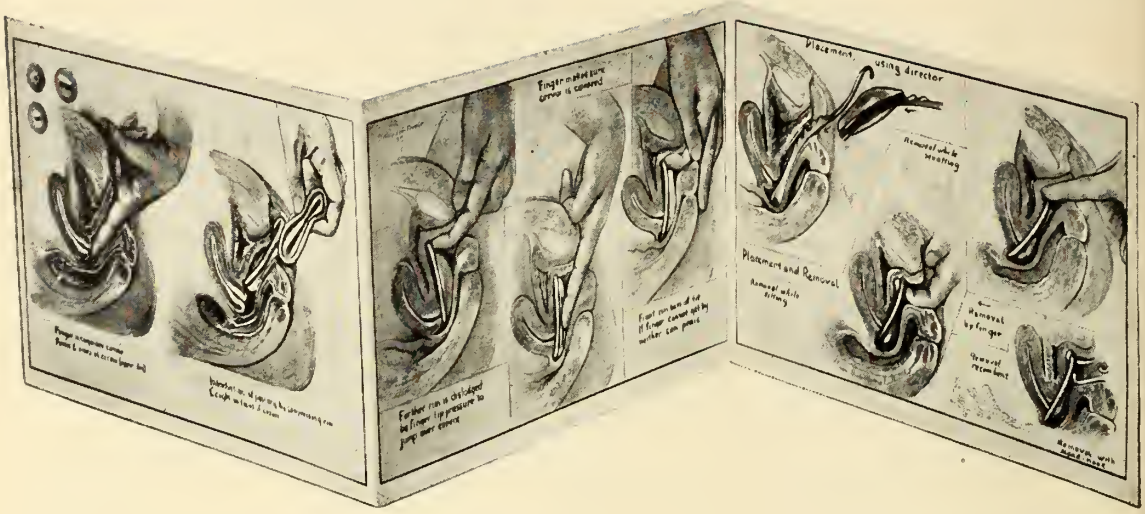
* With men in the Army, the Navy, the Marine Corps, and the Coast Guard, the favorite cigarette is Camel. (Based on actual sales records in Post Exchanges and Canteens.)

Camel

costlier tobaccos



11th Edition Now Out *Send for Copy*



The Technique *of* Fitting Diaphragms

A series of charts in booklet form (6 x 9) clearly illustrating the technique of fitting diaphragms by the physician, now accompanied by the Dickinson-Freret Charts in two colors. For use by the physician in explaining the technique to his patient. These charts are regarded as the most helpful explanatory aid on the subject ever published. Eleventh edition now out. Write, or use coupon, for a copy.

Holland-Rantos
Company, Inc.
551 FIFTH AVENUE, NEW YORK, N. Y.

Holland-Rantos Co., Inc.
551 Fifth Avenue
New York, N. Y.

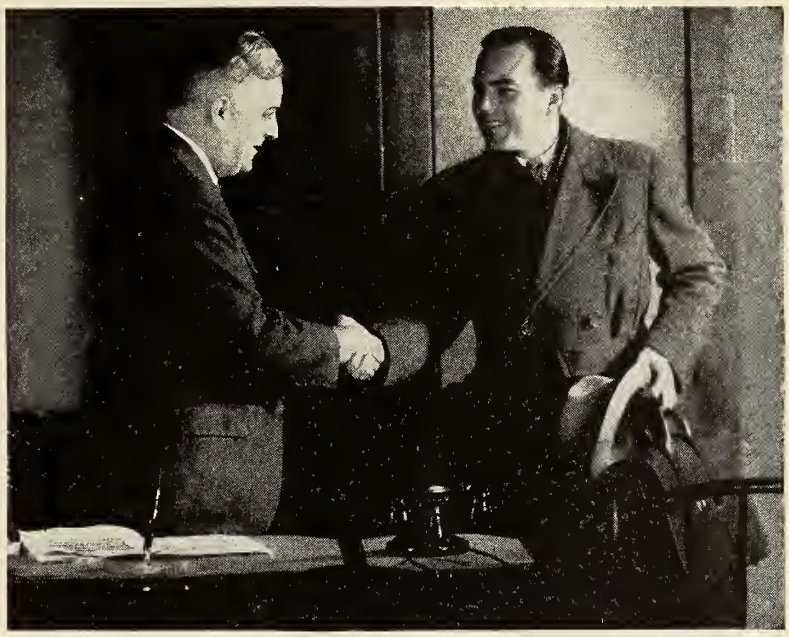
Without cost, please send your booklet on Fitting Technique to:

Dr.....

Street.....

City..... State.....

Personalized G-E Field Service Is Not Only For The Duration



● To users of G-E x-ray and electromedical apparatus, the maintenance service rendered by factory-trained men in G-E's local branches and regional service depots is increasingly important these days. And they are getting it despite many of the handicaps which war restrictions impose.

For many years this personalized field service has been available to G-E customers everywhere, who have come to recognize it as a prime requisite to the continued satisfactory operation of all high-grade technical equipment. That's why G-E Field Service functioned before the war and will continue, on a still larger scale, in the peace years to come.

Perhaps you've heard about "P.I. and A"—G-E's *Periodic Inspection and Adjustment Service*—which, incidentally, was not inspired by the exigencies of war, but for thirteen years has helped physicians, hospitals, and clinics to keep their x-ray and electromedical apparatus in tip-top operating condition.

To become better acquainted with these service facilities provided for your immediate vicinity, you need only to get in touch with one of the following G-E headquarters offices or regional service depots. You'll find the G-E representative who calls on you a reliable source of helpful suggestions.

GENERAL ELECTRIC X-RAY CORPORATION

In your particular area this maintenance and technical service is extended through the following G-E offices and regional service depots:

DETROIT
205 Curtis Building
2842 W. Grand Blvd.

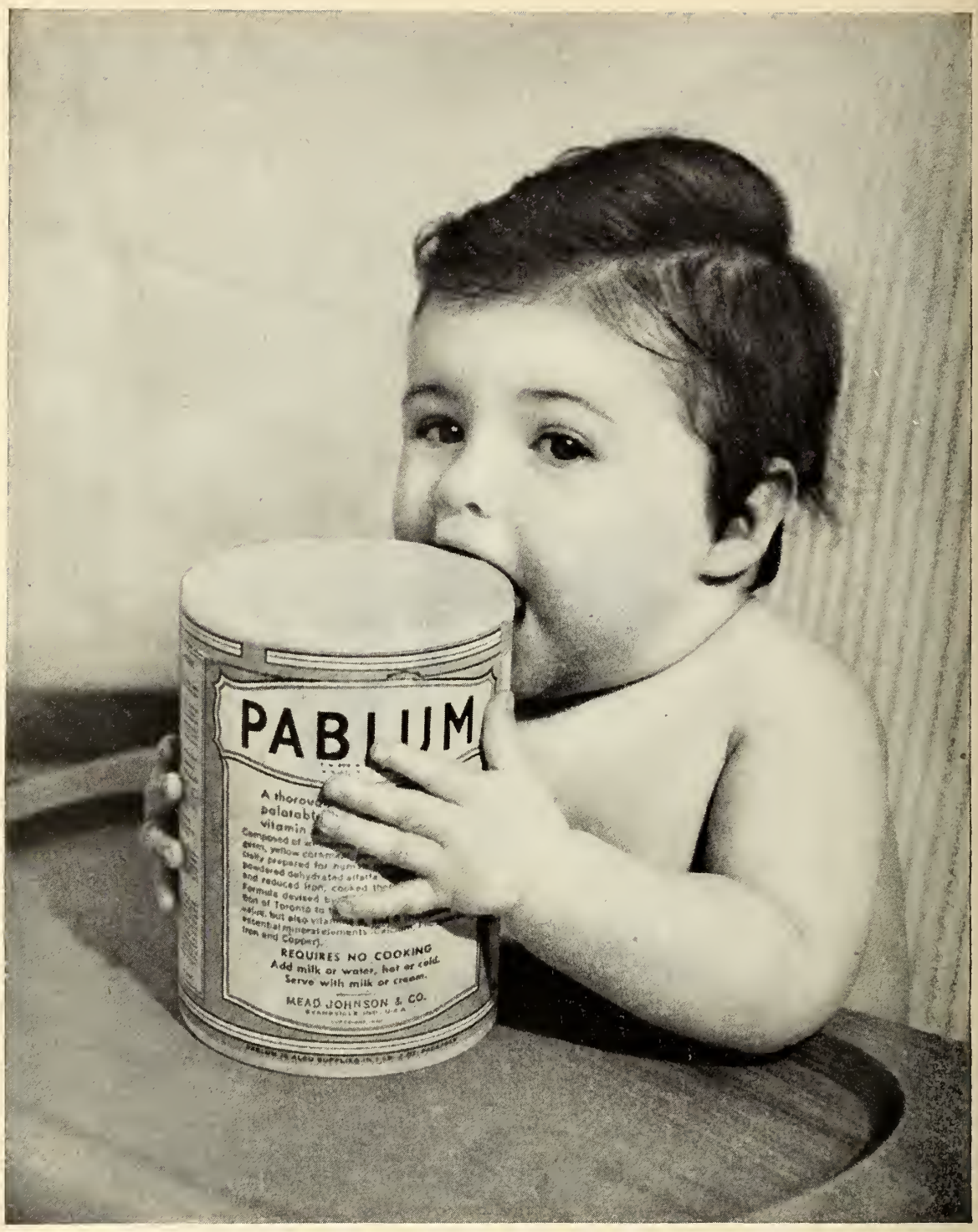
GRAND RAPIDS
225 Diamond Avenue S. E.

LANSING
1701 Blair Avenue

DULUTH, MINN.
526½ East First Street

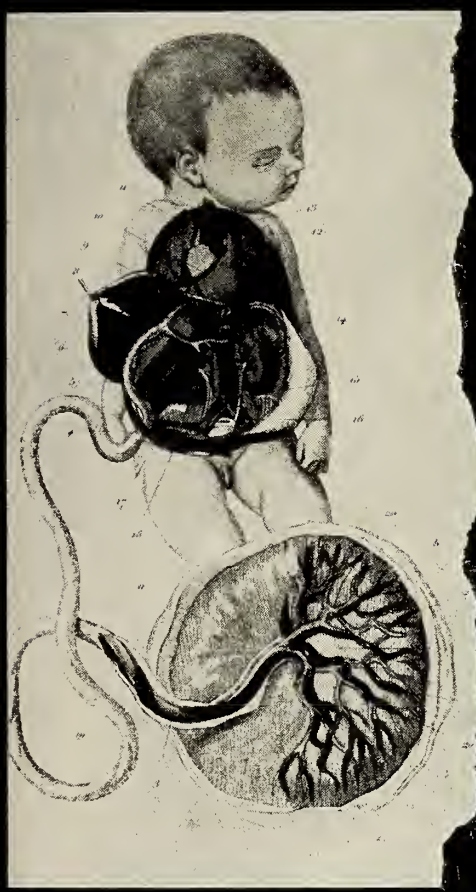
GREEN BAY, WISCONSIN
938 S. Clay Street

Today's Best Buy – U. S. War Bonds



In response to requests from pediatricians, we are now also marketing PABENA—precooked oatmeal, enriched with vitamin and mineral supplements. PABENA closely resembles Pablum in nutritional qualities, and offers the same features of thorough cooking, convenience and economy. Supplied in 8-ounce cartons. Samples on request.

MEAD JOHNSON & COMPANY, EVANSVILLE, IND., U.S.A.



This interesting study of fetal circulation is taken from Antonin Bossu's Anthropologie Etude des Organes, Fonctions, Maladies de l'Homme et de la Dame published in Brussels in 1847.

FOR COMPLICATIONS AS OLD AS TIME

IF NEED for stimulation of labor arises in delivery rooms, obstetricians often rely upon Pitocin*, an oxytocic of many advantages and dependable performance.

Pitocin consists of the oxytocic principle of the posterior pituitary gland with practically none of the pressor hormone. Its extremely low protein content so minimizes possibility of systemic reaction that many physicians prefer Pitocin for routine management of obstetric patients.

Pitocin is indicated for stimulation of uterine musculature in uncomplicated obstetrics, increasing tone of the uterus by direct action. It is widely used in uterine inertia during the second stage and to check uterine hemorrhage.

Pitocin

a product of modern research offered to the medical profession by

PARKE, DAVIS & COMPANY

DETROIT, MICHIGAN

*Trade-mark Reg. U. S. Pat. Off.

ABOUT CLAIMS
vs. ACTUAL DIFFERENCES
in cigarettes

WHAT value can claims of superiority in a cigarette have unless there is a difference in formula or process to justify that claim?

PHILIP MORRIS Cigarettes are *made* differently. In the clinic as well as in the laboratory, the *advantages* of PHILIP MORRIS have been repeatedly observed, repeatedly reported by *recognized authorities* in leading medical journals. Yes, PHILIP MORRIS *claim* superiority . . . *and that superiority has been proved.**

With the current increase in smoking, may we suggest that it is more important than ever for your patients suffering from irritation of the nose and throat due to smoking to change to PHILIP MORRIS—*the one cigarette proved definitely less irritating.*

PHILIP MORRIS

PHILIP MORRIS & CO., LTD., INC.
119 FIFTH AVENUE, N. Y.

** Laryngoscope, Feb. 1935, Vol. XLV, No. 2, 149-154*
Laryngoscope, Jan. 1937, Vol. XLVII, No. 1, 58-60
Proc. Soc. Exp. Biol. and Med., 1934, 32, 241
N. Y. State Journ. Med., Vol. 35, 6-1-35, No. 11, 590-592.

Sneezing begins with Aries...

...ends with



POLLEN ANTIGENS

Lederle

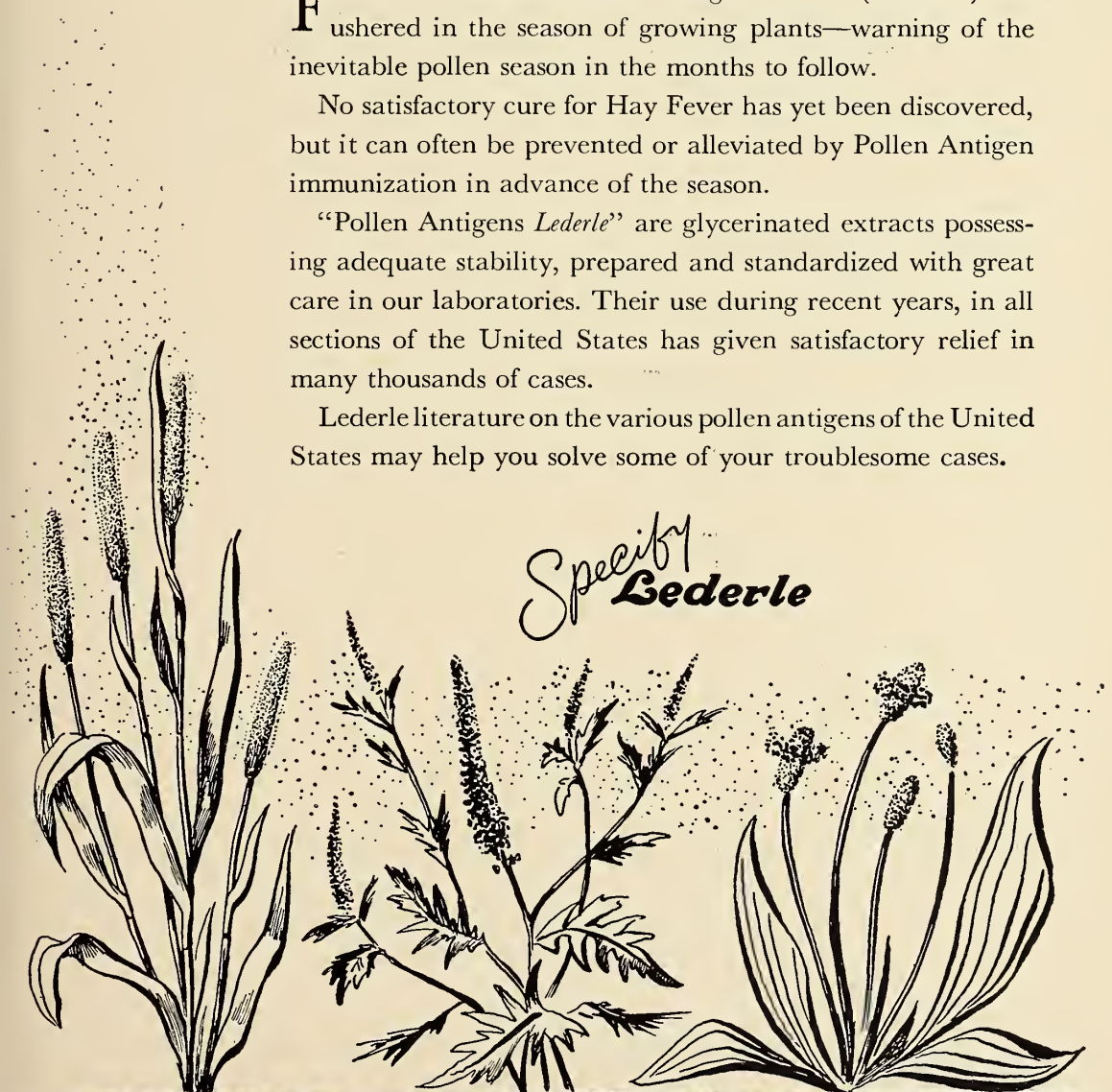
FOR COUNTLESS CENTURIES the sign of Aries (the ram) has ushered in the season of growing plants—warning of the inevitable pollen season in the months to follow.

No satisfactory cure for Hay Fever has yet been discovered, but it can often be prevented or alleviated by Pollen Antigen immunization in advance of the season.

"Pollen Antigens *Lederle*" are glycerinated extracts possessing adequate stability, prepared and standardized with great care in our laboratories. Their use during recent years, in all sections of the United States has given satisfactory relief in many thousands of cases.

Lederle literature on the various pollen antigens of the United States may help you solve some of your troublesome cases.

Specify Lederle



LEDERLE LABORATORIES, INC., NEW YORK, N. Y. — A UNIT OF AMERICAN CYANAMID COMPANY

PYOKTANIN SURGICAL GUT

Plain and Formalized

Manufactured Since 1899 by

The Laboratory of the Ramsey County Medical Society

Packaged dry in hermetically sealed glass tubes in accordance with the new requirements of the U. S. Pharmacopœia.

• • •

Price List

PLAIN TYPE A NONBOILABLE
AND
FORMALIZED TYPE C NONBOILABLE

Sizes.....000 — 00 — 0 — 1 — 2 — 3
28 inches.....per dozen strands $2.00
60 inches.....per dozen strands $3.00

Special discount to hospitals and to the trade. Cash must accompany the order.

• • •

Address

LABORATORY RAMSEY COUNTY MEDICAL SOCIETY

Lowry Medical Arts Building, St. Paul, Minnesota

FOR SALE BY SURGICAL DEALERS AND DRUGGISTS



Quality Survives

At the present time there are no restrictions on the sale of cosmetics. This means that you who use them and we who manufacture them are patriotically bound to observe a sensible self-control of supply and demand. Use your cosmetics conservatively. Buy only those products you need to keep your appearance looking its best. But don't neglect your appearance. A bright, cheerful, well-groomed appearance helps to maintain morale. Men on leave want their womenfolk—their wives and mothers and sweethearts—to be pretty and feminine. . . . We believe that we shall be able to serve you with Fine Cosmetics for the duration. While we may have to make some changes in our packages, we assure you that the quality of the products themselves will not be changed, unless it be for the better. Rather than lower the quality of a product we should abandon its sale for the duration. . . . We appreciate your patronage and seek to merit its continuance by a strict adherence to the motto of our organization, which is — "Quality Survives."

Luzier's Fine Cosmetics and Perfumes Are Distributed In Minnesota By:

District Distributors

Louise Roberts
304 Medical Arts Bldg.
Minneapolis, Minn.

Emma von Domarus
610 3rd St. S.E.
Little Falls, Minn.

Kay McCarthy
Fairmont, Minn.

Mae Nagle
Ormonde Hotel
Virginia, Minn.

Assistant District Distributor

Eva Byrne
610 3rd St. S.E.
Little Falls, Minn.



REST HOSPITAL

A quiet, ethical hospital with therapeutic facilities for the diagnosis, care and treatment of Nervous and Medical cases. Invites coöperation of all reputable physicians who may supervise the treatment of their patients.

PSYCHIATRISTS IN CHARGE
Dr. Hewitt B. Hannah
Dr. Joel C. Hultkrans

2527 2nd Ave. S., Minneapolis, Phone At. 7369

POKEGAMA SANATORIUM

operated by

H. LONGSTREET TAYLOR FOUNDATION

Reception Hospital



Thoroughly Equipped for the
Medical and Surgical Treatment of

TUBERCULOSIS

Artificial pneumothorax, oleothorax, phrenicectomy, thoracoplasty, pneumolysis, bronchoscopy, alpine lamp and heliotherapy. Operating, throat, dental and lamp rooms. Complete clinical and X-ray Laboratories.

Electric Blankets in All Beds

A reduction has been made in rates.

Railroad, Bus, Telegraph and Telephone Stations: Pine City, Minn. Descriptive circular sent on request.

F. F. CALLAHAN, M.D., Medical Director
POKEGAMA, PINE COUNTY, MINN.

CHILDREN ADMITTED

The doctor* oughta know about this...



WITH an empty Karo bottle, the baby has a right to complain. And perhaps, Doctor, so have you. We admit that occasionally grocers do not have Karo syrup.

The situation is this: The great demand for Karo by the armed forces and a huge increase in domestic needs so tax our capacity that we are not always able to keep all grocers supplied.

We cannot step up quantity any further without letting down on quality and this we will *never* do.

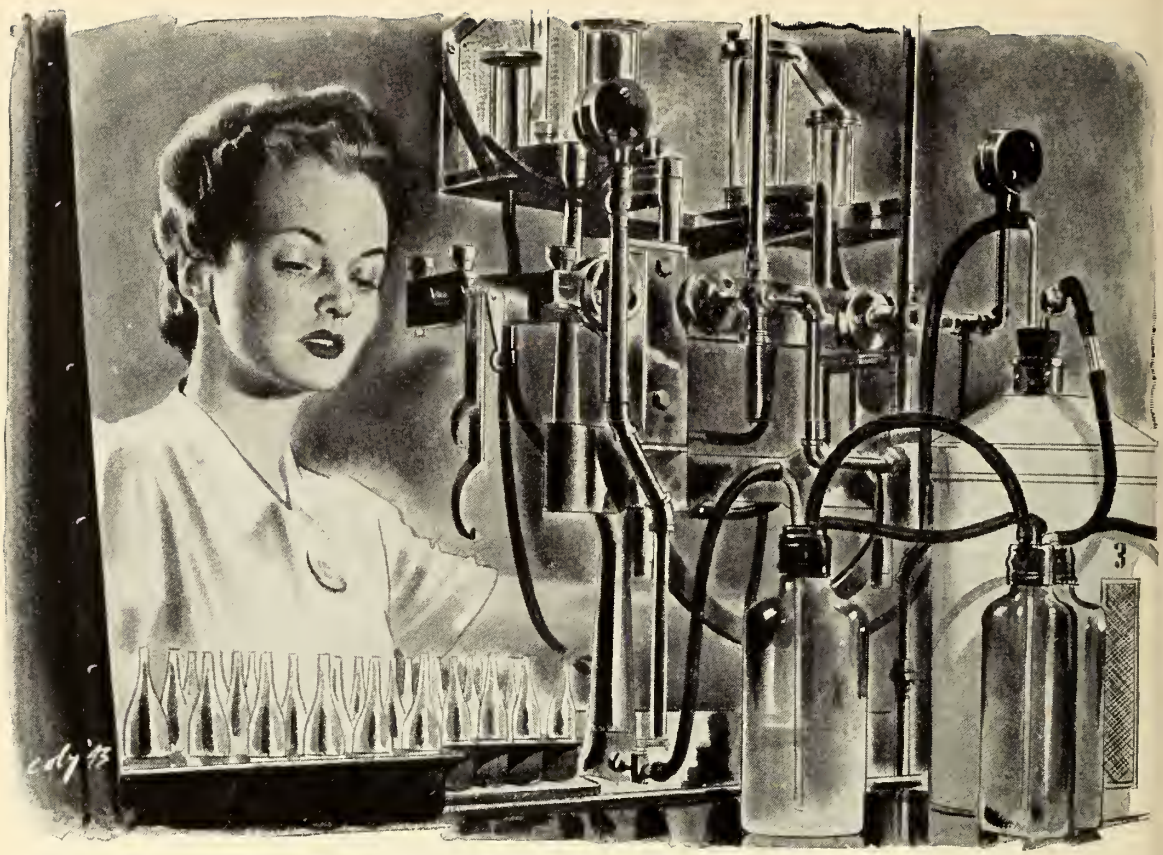
If any patient complains that she is unable to obtain Karo for her babies, please tell her to write us direct, giving us the name and address of her grocer and we will promptly take steps to provide this grocer with Karo.

CORN PRODUCTS REFINING COMPANY
17 Battery Place, New York, N. Y.

ACCEPTED
AMERICAN MEDICAL ASSN.
Council on Food



* INCIDENTALLY, Doctor, Red Label Karo and Blue Label Karo are interchangeable in standard feeding formulas. Their chemical composition is practically identical; their caloric values are equivalent. So if your patients cannot get the flavor you prescribe, please suggest that either Blue or Red Label may be used.



Machines that Seldom Stop

DEMAND for medicinal supplies at the fighting front doesn't begin at eight o'clock and stop at five. In war there is no forty-hour week and casualties must be treated at all times—day and night.

Lilly employees feel deeply their obligation to produce a full share of essential therapeutic agents. Uppermost is the thought that machines must turn eight — sixteen — twenty-four hours a day to fill the needs of the allied armed forces.





BUY WAR BONDS

Lilly

ELI LILLY AND COMPANY • INDIANAPOLIS, INDIANA, U. S. A.

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 March, 1943 No. 3

THE DIAGNOSIS OF CORNEAL LESIONS

F. H. HAESSLER, M.D.

Milwaukee, Wisconsin

THE intent of this paper is not to present new facts about corneal disease. All textbooks contain adequate descriptions of the various diseases of the cornea, and once the diagnosis is made, the physician can easily find whatever he may want to know by consulting his books. Unfortunately the patient does not come to the office with a diagnosis pinned to his lapel. Therefore, what I wish to discuss today is how, with the patient before one, a diagnosis is reached, in what order do the signs of corneal disease come to the attention of the physician, how he can evaluate and interpret them, so that the diagnosis will be clear.

Diagnosis is a practical exercise and there are many ways of arriving at it. Rarely does one begin with one observation which can be used as the starting point for a chain of flawless logic. Usually one makes a collection of observations, a mental review of clinical pictures which pass through the mind in less time than it takes to tell and from these one selects several which together may suggest a diagnosis. This is then refined by further differentiation from other somewhat similar disease pictures. An elastic method, rather than the strictly systematic method of, say, chemical analysis, is needed, not only because of the gaps in our knowledge, but because of the nature of the processes we are investigating.

The cornea, on gross inspection, seems to be a homogeneous watch-crystal-like membrane, but it can be the seat of as many distinguishable diseases as any other organ of the body. It may react in a variety of ways to the same type of harmful agent, or, on the other hand, one particular type of reaction may be produced by different stimuli. Thus, at first glance, the diagnosis is rarely clear.

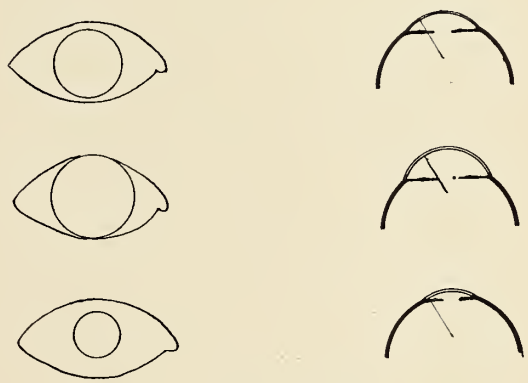


Fig. 1. Diagrams of variants of corneal diameter. From above down: Normal, megalocornea, microcornea. Note that in all diagrams the radius is constant, the diameter variable.

Diagnosis of corneal lesions depends on the observation of the following important manifestations:

1. Changes in size and shape.
2. The presence of pigment.
3. The presence of blood vessels.
4. Modification of transparence.

Sometimes a diagnosis may be made by the analysis of one of these elements. More usually it

Presented in symposium at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 1, 1942.

is necessary to recognize a small group of characteristics. Modifications of transparence are so universal in corneal disease that further details of the modification must be described.

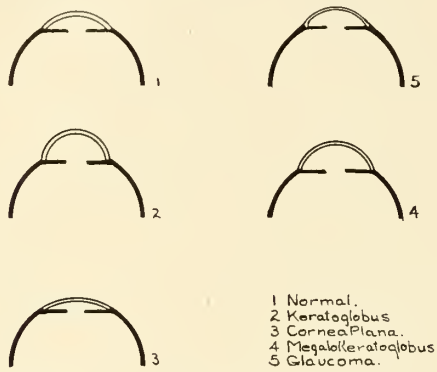


Fig. 2. Diagrams of variants in corneal curvature. In 1, 2, and 3 the diameter is constant and the curvature varies. In diagram 4 there is an increase in both diameter and curvature. Diagram 5 emphasizes an important differential detail which distinguishes megalocornea which is a developmental anomaly from one which is secondary to infantile glaucoma. The sharp line of demarcation between corneal and scleral curvatures is obliterated.

Changes in Size and Shape

The observations of interest are size, curvature and the distance from the iris level. The horizontal corneal radius is 11.6 mm., its radius of curvature 8 mm., and its superficial refraction 45 D. Regular variations from these normal diameters are megalocornea and microcornea, and of the curvatures are keratoglobus and cornea plana. The enlargements—megalocornea and keratoglobus—can only be distinguished by measurement. Most often it is the unusual chamber depth that arrests the attention of the examiner and further analysis is suggested. However, pure keratoglobus is so extremely rare that it need hardly be considered. A matter of real importance is the decision whether the large cornea is a manifestation of gigantism—an anomaly of development—or the result of the fetal or juvenile glaucoma. The latter may have been spontaneously arrested or may still be active. To rule out glaucoma, one searches for the absence of corneal opacities, in particular dehiscences of Descemet's membrane, the normal groove that sharply demarcates the cornea from the sclera, absence of glaucomatous excavation of the optic cup, for normal function, and one measures the tension. In megalocornea, which is a congenital gigantism, bilateral measurements are apt to be identical: the corneal radius is apt to be shorter in gigantism and increased in glaucoma.

When the measurements are appreciably decreased, a diagnosis can usually be made by inspection. Microcornea may be part of a microphthalmos with normal refraction, and distinguishing measurements cannot be made. In cornea plana there is usually no change of curvature at the point of transition from cornea to sclera. For the clinician it is important to remember that 20 per cent of people with microcornea get glaucoma.

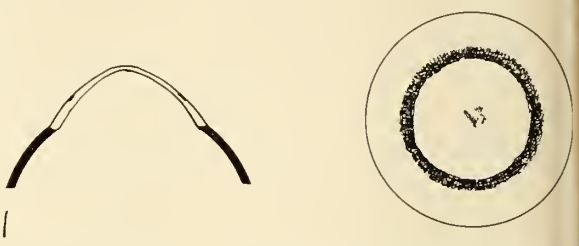


Fig. 3. Diagrams of the characteristics of keratoconus. The figure on the left is a diagrammatic cross section which shows the change in corneal curvature and the location of the pigment ring in the deepest epithelial stratum.
The figure on the right shows the position of the pigment ring and the keratoconus lines and diffuse clouding at the apex.

Keratocornus is also diagnosed by inspection of the globe for variations of size and shape, though in its early stage it is more often suspected from the presence of irregular shadows noted during retinoscopy. It begins near the end of the first decade of life and is characterized by the formation of a cone with a thin apex, keratocornus lines which are parallel wavy lines in the deepest stromal strata, dehiscences in Descemet's membrane, a hemosiderin ring about the base of the cone in the deepest epithelial layers and decreased vision with irregular refraction.

In differential diagnosis congenital anomalies of curvature might be considered, particularly if they are accompanied by rupture of Descemet's membrane. One must not be misled by hyaline infiltration of the corneal apex, which sometimes suggests a cone. The safest diagnostic aids are the cone with thin apex in the optical section of the slit-lamp beam and the hemosiderin ring.

The irregular changes in form, such as facet, Descemetocele, staphyloma, neoplasm, and even pterygium are too obvious and characteristic to need detailed consideration.

Pigmentation

The characteristic pigmentary manifestations are easily recognized if one bears in mind their significant characteristics.

1. Stahli's line: an irregular light brown line,

sometimes branched in the deepest epithelial layers associated with pigmentation of Bowman's membrane.

2. The hemosiderin ring of keratoconus which

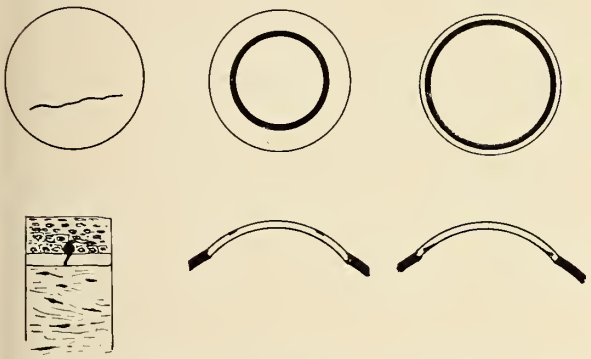


Fig. 4. Pigmentation: 1. Stahli's Line; 2. Hemosiderin ring of keratoconus; 3. Ring of pseudosclerosis and chalcosis.

is in the deepest epithelial layer and surrounds the base of the cone.

3. The Kayser-Fleischer ring, which is a characteristic of pseudosclerosis or Wilson's disease. In this disease, it is always bilateral. It is dark greenish brown, begins at the limbus-like gerontoxon and fades out centrally. It consists of innumerable granules on or near Descemet's membrane. It is also seen in chalcosis and then may be unilateral.

4. Melanotic pigmentation is often seen in the epithelial cells over the limbus and may extend out to the cornea.

5. On the posterior surface uveal pigment may be deposited where the convection current becomes slowed. Some striking forms have received specific names such as Krukenberg's Spindel, but none have specific significance in corneal diagnosis.

As rareties one may observe other colored inclusion in the corneal tissue: (a) blood pigment that has been deposited after laked blood has been absorbed by the stroma after injury, (b) metals, notably silver; and (c) colored crystals such as uric acid in gout.

Corneal Vessels

Vascular proliferation is the most spectacular manifestation of corneal disease. Though there is perhaps no characteristic of blood vessel growth that is pathognomonic of one etiological factor or nosological entity, nevertheless an evaluation of this phenomenon is of utmost importance in diagnosis.

Vessels start as capillary loops and gradually proceed toward the corneal lesion. As the network becomes more extensive some of the vessels become very thick and form a main stem from



Fig. 5. Types of vascular branching. (*Left*) Angle bound vessels of anterior stroma. (*Right*) Level bound vessels of deep stroma.

which smaller vessels get their supply of blood. They may arise from the most superficial network of the limbus and be ultimately conjunctival in origin or they may be offshoots of deeper vessels of the ciliary circulation. Whatever their origin, they arise with great accuracy in the stromal level occupied by the lesion which stimulates their growth. What mechanism may be concerned in producing the proliferation is not completely understood. The presence of pure fibrin alone, a constituent of most inflammatory exudates, is known to be effective in producing vascularization. In the optical section of the cornea produced by the slit-lamp beam it is often possible to locate accurately at what level the new-formed vessels arise. When partial loss of transparence makes this difficult, the general pattern of branching is very helpful. The blood vessels grow between groups of corneal fibers and their pattern is determined by the grouping of fibers of the corneal stroma. In the superficial portions the fibers are an interlacing network of bundles arranged in divergent planes, while in the deeper strata they are arranged in planes parallel to the corneal surface. Consequently, very deep vessels all lie in one plane and are level bound, while those in the superficial stroma are angle bound because the vascular loops diverge from one another as they follow spaces between diverging of the bundles. Holger Ehlers has published excellent pictures of this characteristic arrangement.

The presence of vessels gives some information as to the length of time the corneal disease has existed. It takes at least six weeks to develop pannus.

The vessels for the most part are an advantage in that they increase the resistance of the cornea to invasion. They may be at times distinctly harmful and then their destruction may become

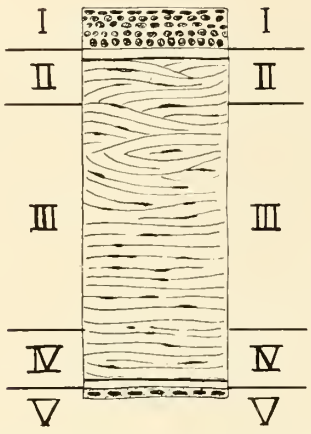


Fig. 6. Diagrammatic cross section of the cornea which shows the five zones, each of which is characterized by definite pathological reactions.
The arrangement of fiber bundles indicates the reason for the development of angle bound and level bound branching of corneal blood vessels.

therapeutically necessary. This is not only true when a vessel is so large that it is optically obstructive: in allergic lesions such as vascular fasciculus the blood vessel brings new antigens to the site of the disease so that the destructive process is kept active.

Prognostically one observation may occasionally be useful. When the question of enucleation for chronic intraocular inflammation arises the presence of vessels in a cornea that was not the primary seat of inflammation makes it almost certain that the eye will not recover, and the necessity of enucleation is confirmed.

Modifications and Transparence

In almost all corneal disease there is modification of transparence. There are differences in the character of the opacities which are important to note, but the most fundamentally useful fact is the recognition of the observation that the cornea may be divided into five layers which are distinguishable histologically and that each seems to have definite clinical manifestations associated with it.

These are:

1. The epithelium. Its histological and clinical independence is obvious and bio-microscopical study has revealed that some of the hitherto unexplained deeper lesions of the cornea are merely sequelæ of a process primarily in the epithelium.

2. Bowman's membrane and the superficial layers of stroma. Lesions of this region often coexist with those of region one, but scarring may remain here after the epithelium is entirely healed.

3. The middle lamellæ constitute three-quarters of the thickness of the cornea, and is least often the seat of disease. Often zones 2 and 4 may both be involved while zone 3 remains intact. It is its extreme resistance which sets this layer apart.

4. This zone consists of the deepest stromal lamellæ and Descemet's membrane. It plays the principal role in some of the most important diseases of the cornea. Here parenchymatous keratitis of hematogenous origin makes its first appearance, even when it later involves the superficial layers, and after healing such vestiges as scarring and microscopic vessels are usually found in this zone. It reacts with the greatest facility to superficial infections and also to deep inflammations which come from the iris and anterior chamber.

5. The endothelium, though histologically a part of the cornea, reacts pathologically with the iris and anterior chamber.

For purposes of diagnosis, then, lesions are predominantly epithelial, superficial or deep. It must be emphasized that any clinical picture of corneal disease may be complicated by scars and blood vessels (obliterated or active) which are remains of a healed lesion of an entirely different sort.

The group of diagnostic entities in which the clinical manifestations are epithelial or first manifest in the epithelium are:

(a) superficial punctati keratitis
(b) dentritic keratitis
(c) recurrent erosion
(d) filiform keratitis
(e) edema and bullous keratitis
(f) epithelial dystrophy
(g) a group of diagnostically related manifestations whose diagnosis usually depends on the observation of other manifestations, namely
    (1) xerophthalmia
    (2) lagophthalmia
    (3) keratitis neuroparalytica
(h) papules in allergic states such as phlychemtes, vernal catarrh
(i) foreign body

It would not be fruitful to comment pedantically on each of these diagnostic units. Instead, I shall mention only the more interesting phenomena, which make some of the pictures conspicuous.

Superficial punctate keratitis, dentritic keratitis, keratitis bullosa and recurrent erosion hardly need more detailed description than is contained in the name. An important characteristic they have in common is the fact that all may be manifestations of herpes. The recognition of this fact is important because it is presumably true that they may be cured if the virus is destroyed with the affected epithelium while it is still limited in its distribution to that tissue. Later, the virus may cause deep-seated lesions which may destroy vision. The virus is neurotropic and dermatotropic. By inoculation into the central nervous system of rabbits the neurotropic properties may be greatly increased and by warming it, it will return to its dermatotropic state. It is even possible that some cases of herpes zoster are caused by this virus. The most characteristic herpetic lesion is dendritic keratitis with its branched irregular linear lesions. The lesions may go deeper in the form of little gray ulcers but the linear contours of map-like irregularities are always suggestive. The serious complication of herpetic infection is keratitis disciformis, whose diagnosis will be discussed with other lesions of the deeper lamellæ.

Some of these same lesions are often non-herpetic. Keratitis punctata superficialis is the common reaction of the epithelium to any irritant and is a frequent accompaniment of acute conjunctivitis. Keratitis filiformis needs special mention because it has recently become clear that in many cases of keratitis filiformis the characteristic corneal lesion in which partially detached cell masses of the epitheium are wound into threads by the winking of the lids, is only one part of a syndrome. It occurs for the most part in elderly women, because the cornea is dried for lack of tears, which results from an atrophy which involves the lacrymal glands, as well as the salivary. Though therapy is unsatisfactory, the diagnosis may at least be made. A strip of filter paper properly placed between the lids becomes only slightly moistened in five minutes, while a similar piece placed in the eye of a normal control quickly becomes thoroughly wet for a distance of several centimeters.

Epithelial dystrophy is a rare disease which never occurs much until forty years of age and is usually bilateral, though a patient is occasionally observed when only one eye is involved. The epithelium in the paraxial portion of the cornea becomes dull and slightly turbid. Later vesicles or blebs form which rupture and cause a small loss of substance. Later the anterior stroma may become faintly gray. Characteristically the disease is a degeneration of both epithelium and endothelium and when in doubt about the diagnostic interpretation of the epithelial lesion, the characteristic holes in the endothelial mosaic when viewed in specular reflection confirm the diagnosis. Eventually the entire corneal surface becomes involved. The group of diseases which includes xerophthalmia, lagophthalmia and keratitis neuroparalytica all start with opacities in the epithelium, but soon involve the deeper tissues as well. The differentiation is made by consideration of the other effects of the causative agent which is respectively Avitaminosis A, inability to close the lids, and sensory paralysis of the branch of the fifth nerve which contains the afferent fiber from the cornea.

The Lesions which Involve Bowmann's Membrane and the Superficial Stroma

The lesions which involve this portion of the cornea may be considered in groups, the members of which have certain characteristics in common.

I. Foreign body with its ring of siderosis
   Trachoma
   Rosacea keratitis
   Phlyctenule and vascular fasciculus
   Vernal catarrh
II. The large group of ulcers
   Serpentic ulcer
   Annular ulcer and ring abscess
   Marginal ulcer
III. Rodent ulcer.
IV. Subepithelial striation from hypotony.
V. Familial dystrophies
   Band keratitis

The only lesion of the first group that needs comment is rosacea keratitis. It has recently come to notice that some cases respond to treatment with riboflavin. Its diagnosis occurs in a number of forms, namely—(1) marginal ulcer; (2) a subepithelial infiltrate which may be confused with phlyctenular disease; (3) a severe progres-

sive form that resembles rodent ulcer. Rosacea keratitis is probable when the suspected lesion is accompanied by acne rosacea of the face, when the vascularization is strikingly sparse but consists of a few thick vessels, when there is a tendency for the lesions to soften and become incrusted with calcium and if the lesion is very persistent and recurrent.

There is a peculiar arrangement of the vascular tissue which is very suggestive of rosacea. The vascularized tissue is slightly raised above the level of the surrounding cornea. All vessels end at the same sharp line of demarcation, where the tissue surface drops directly and vertically to the normal cornea level. The subepithelial rosacea infiltrates are not limited to the periphery but occur anywhere on the cornea.

Great care must be exercised in the differentiation of extensive progressive and destructive rosacea from rodent ulcer. With the latter the advancing edge is always undermined, while in rosacea the advancing edge is thickened and presents the appearance of an irregular linear mound.

The ulcers which involve this stratum do not need detailed description. The seriousness of the violent inflammation which characterizes the exogenous ulcer of serpentic type and contrasted with the milder smouldering endogenous marginal ulcer is well known. When caused by penumococcus, the organisms are best cultured from the base of the ulcer and the greater intensity of the opacity in the base often suggests the etiology. Diplobacillus also may cause a serpentic ulcer, but it causes greatest damage and densest infiltration at the sides. Occasionally similar ulcers are caused by streptothrix or mold. They may run a typical stormy course with hypopyon or may produce a milder reaction that results in a lesion that must be differentiated from disciform keratitis. The diagnosis can only be made by lifting out the mycelium and identifying it microscopically.

A special diagnostic problem is the annular ulcer and ring abscess. A number of cases have appeared in the literature from time to time. Though they doubtless do not represent a single clinical entity, they do show two characteristics. The opacity that occurs is ring-shaped and the lesion is distinctly more dangerous than a similar change which does not completely cut off the corneal center. Even the usually mild marginal ulcer, when it surrounds the entire margin, needs careful watching and may necessitate decompression of the anterior chamber. More severe and dangerous is a ring that develops farther from the margin in old trachoma eyes with pannus, often long after the conjunctival lesion has healed. The ring-shaped opacity becomes completed very quickly once the process has started and usually the eye can only be saved by prompt keratotomy. Most fulminating of all is the rare ring abscess. This disease is characterized by the development of an annular pyocenic infiltration of the stroma which develops quickly as a single lesion, not merely as an ulcer that progresses till it completes a circle.

It may follow any perforating or non-perforating injury and has even been reported after incision for cataract. The eye is usually lost through panophthalmitis.

The clinical picture of rodent ulcer is characteristic, especially if one remembers that it is a superficial, smouldering, destructive lesion that gradually involves the entire corneal surface after a start at the limbus. The advancing edge is always undermined and a rather irregular fine grey line. It is usually unilateral, very painful and usually seen in debilitated persons.

The familial corneal dystrophies are lesions that are characterized by gradually increasing opacity in the most anterior stroma lamellæ, which reduce visual acuity. There are three distinct types and there are not transitions between them. They have certain characteristics in common. They all begin in youth in both eyes and not uncommonly develop symmetrically. Painful attacks may occur in all of them. The three types are: (1) granular; (2) macular; (3) lattice.

The *granular* is characterized by dominance in inheritance. The opacities start as fine white points arranged in a radiating line, which, in the course of time, coalesce to form larger glassy white granular opacities of many shapes. By the time the patient is thirty or forty, a central disc of the cornea is fairly filled with discrete opacities. A marginal zone 2-3 mm. wide always remains clear, and so does the tissue between the granules. The epithelium always remains intact, though later it may project over granules. Corneal sensitivity is often reduced in spots. Corneal vessels do not develop.

The *macular* form is recessive in inheritance, hence becomes manifest in inbred families. It

starts early and the cornea is seen to be slightly turbid. Soon ill-defined discrete opacities develop in the turbid layer. They are larger than the opacities of type I and not sharply defined. The lesion occupies the entire corneal area. There is no clear marginal zone. The epithelium is intact, though it may project over opacities as in type I. Vascularization does not occur.

The lattice dystrophy is dominant in inheritance and is very rare. It begins a little later in life than the other two, usually in the second decade. In the beginning, the cornea looks grossly normal, though in focal illumination the surface is slightly dull and may even stain slightly with fluorescin.

The slit-lamp reveals countless fine threads, sometimes dichotomously branched, which in retroillumination give the impression of microscopic clefts. These lattice fibers occur particularly in an intermediate zone. The periphery remains entirely clear and the fibers decrease greatly in number toward the center. The lattice fibers are transparent and refractile and between them are innumerable fine granules. The surrounding corneal tissue in which they are imbedded remains clear. In middle age the hitherto clear central cornea becomes the seat of a discoidal opacity that is grossly visible. In the optical section it is seen that the lattice fibres are optically empty canals (in contrast to the corneal nerves), transverse the stroma at angles rather than parallel to the surface and involve fairly deep layers of the stroma.

The epithelium becomes rather uneven and produces an irregular astigmatism. The visual acuity is greatly reduced, usually to 20/200 in the fourth decade. Inflammatory episodes are not uncommon and are the result of epithelial erosion.

Lesions of the deepest stromal lamellæ and Descemet's membrane, the typical deep stromal layer, are: (1) parenchymatous keratitis; (2) keratitis annularis, a manifestation of 1; (3) keratitis disciformis, and (4) keratitis pustiliformis profunda.

By far the largest portion of parenchymatous keratitides are luetic in origin. The disease picture is well known and characterized by loss of transparence in the deeper strata from cellular infiltration and edema. The first stage is best observed in the second eye where a delicate veil-like opacity of the deepest lamellæ or Descemet's membrane may be seen when the eye is still free from all irritation and perfectly pale. These opacities are almost always peripheral and gradually spread to the center. Usually a few fine postcorneal deposits appear and it takes up to five weeks before opacities become grossly visible and the first signs of hyperemia become manifest. The vascularization also begins characteristically in the deepest strata. In later stages the entire cornea may become opaque and vessels proliferate at all levels. In those which heal, the last vestiges that remain are delicate opacities and collapsed vessels on the Descemet's membrane.

Positive Wassermann reaction and the presence of other manifestations of congenital syphilis aid in the diagnosis. Rarely a similar lesion is observed in acquired syphilis, but also in the complete absence of syphilis the cornea may be similarly involved. Such cases have been reported after grippe, parotitis and other general infection diseases.

Tuberculosis is also the cause of a parenchymatous keratitis. This etiology is suspected when the Wassermann is negative and Mantoux positive, and when certain characteristics of the lesion itself that suggest tuberculosis are present. A tuberculosis lesion is usually central, that is, paraxial and is much less diffuse, so that it gives the impression of being a focal lesion. The vascular supply consists not of innumerable thin vessels that come from all about the periphery but of a few stout stems whose terminal branches surround the lesion, glomerulus-like.

Occasionally in syphilitic keratitis the opacities are so arranged that they form an opaque ring in the depths of the corneal stroma. The lesion is then called keratitis annularis. The lesion may occasionally be mistaken for keratitis disciformis and the resemblance may be very great. The latter is a complication of herpetic corneal disease. The outstanding characteristic is a cream-colored disc or ring in the deeper corneal stroma. It may also be vascularized but usually other characteristics of spyhilitic keratitis such as delicate opacities and vessels in other parts of the cornea, or syphilitic keratitis in the fellow eye accompany a syphilitic annular lesion. In the slit-lamp picture keratitis annularis consists of groups of small granules, while the ring of keratitis disciformis consists of cloudy particles.

Keratitis pustiliformis profunda usually causes no diagnostic difficulty. It is characterized by the appearance of a small group of tiny pustules on

Descemet's membrane all surrounded by a delicate veil-like opacity. It is not common, but is usually seen in males near forty and is a manifestation of syphilis.

There are a few lesions of Descemet's membrane that should be mentioned. Frequently in severe intraocular disease, particularly when there have been disturbances of intraocular pressure, folds develop which are easily recognized by their double contour. Ruptures of the elastic membrane are seen after trauma. A rarity is the network of glassy fibers that may traverse the anterior chamber. They are like Descemet's membrane in structure and may be covered with endothelium. A not uncommon senile finding is the development of excrescences that are analogous to Drusen. They may be recognized by their effect on the endothelial mosaic when observed in specular rezection.

Endothelial dystrophy has been mentioned as an integral part of epithelial dystrophy.

EUSTACHIAN TUBE FUNCTION AND DEAFNESS

J. R. LINDSAY, M.D.

Chicago, Illinois

THE importance of the state of eustachian tube function becomes evident when it is realized that the major cause of deafness in early years is inflammatory disease of the tube and this type provides the main opportunity for reducing disability due to impaired hearing.

Deafness due to inner ear disturbance, congenital or acquired, is much less frequent in the child and since these types are not amenable to treatment they become chiefly an educational problem. Also otosclerosis which causes disability frequently in early adult life can neither be prevented nor cured, and is an individual problem not related to eustachian tube difficulties.



Fig. 1. Cross section of the eustachian tube in the cartilaginous portion. The lumen is slit-like, supported by cartilage, except for the lower lateral two-thirds of its wall. C. Carotid artery. F. Connective tissue and fat. M. Muscle fibers.

middle ear. Not only does the restoration of normal function of the tube constitute the greatest factor in prevention of such deafness, but the early recognition and treatment of deafness of

From the Division of Otolaryngology of the University of Chicago. Presented in Symposium on Eye, Ear, Nose and Throat Diseases at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 1, 1942.

The chief avenue for preventing and reducing hearing disability lies in the early recognition and adequate treatment of conditions which impair eustachian tube function.

reviewed. The bony portion of the tube is about 12 mm. in length in the adult and the cartilaginous portion about 24 mm. The cartilage has the form of an inverted J (Fig. 1), the anterior end

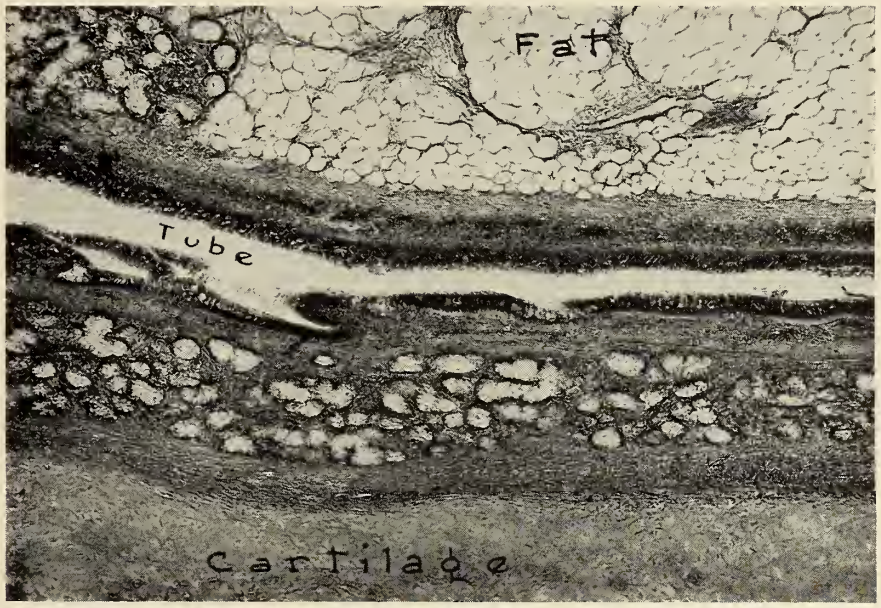


Fig. 2. High power magnification of the eustachian tube in the cartilaginous portion to show the columnar ciliated epithelium, the mucous glands, connective tissue and fat.



Fig. 3. Horizontal section through the superior border of the eustachian tube showing peritubal cells. Some fibers of the tensor tympani muscle which lies above and medial to the bony part of the tube are seen. M.E. Middle ear. C. Carotid artery.

Anatomy

In order to understand the physiology of the tube certain pertinent anatomical features may be

forming the Torus Tubarius. The tube lumen appears as a vertical slit in cross section. The inferior lateral wall is supported by connective tissue and is subject to the action of a group of

muscles, the levator veli palatini, the tensor veli palatini and the salpingo pharyngeus.

The tube is lined by ciliated columnar epithelium in the cartilaginous and bony portions (Fig. 2). The cilia disappear as the middle ear is reached. The peritubal cells (Fig. 3) vary in size and number, some being lined by an extension of the ciliated epithelium of the tube, others by cuboidal or flattened epithelium. The mucosa of the cartilaginous portion has many mucous glands.

It is obvious from the anatomical arrangement that the tube is equipped with an active mechanism for keeping moist and sweeping excess secretion toward the pharynx by ciliary action, also that the structure of the cartilaginous portions makes possible the efficient closure of the tube unless during the active pull of certain muscles, thereby providing a mechanism for protection and isolation of the middle ear from infections, noises and pressure disturbances in the pharynx.

Physiology

While the tube was named after the Italian anatomist Eustachius of the sixteenth century it is only in recent times that the function has been well understood.

Toynbee[7] of the Cornwall infirmary in England was the first to show in 1853 that the tube is normally closed. He thought that the sense of fullness in the ears produced by swallowing while holding the nose closed was due to air being trapped in the middle ears. This became known as Toynbee's maneuver. The fact that it was necessary to swallow to relieve the sense of pressure indicated to him that the tube opened during the act of swallowing.

It was Politzer[5] who in 1864, by means of a manometer sealed in the external canal, showed that Toynbee's maneuver caused an inward movement of the drum due to removal of air from the middle ears.

Jago,[3] working with Toynbee, supported the observation that the tube is normally cosed in a classical series of observations on himself on a group of symptoms which he correctly interpreted as due to a continuously open tube.

Hartmann[2] in 1879 had worked out basic quantitative data on eustachian tube function with the use of the pressure chamber and manometers. He made the following observations:

1. Increase of pressure to 130 mm. Hg. would not force the tube open but resulted in a sense of extreme pressure and pain in the ears. Only by active swallowing could the symptoms be prevented.

2. Rapid decrease of the pressure caused a spontaneous exit of air through the tube beginning when the pressure was lowered 30 mm. Hg. below that of the middle ear.

3. In order to inflate the ear by Valsalva's method a pressure of 20 to 40 mm. Hg. was normally required. During phonation of the vowels the resistance to inflation was reduced from 32 to 12 mm. Hg. and also that flexing the head on the chest increased the resistance.

In 1936, Zöllner,[9] in attempting to determine criteria for normal tube function in candidates for aviation service, reported quantitative studies of pressure required to inflate the middle ear during swallowing.

He found that the tube doesn't open entirely but that positive pressures of from 0.5 to 4.0 mm. Hg. in the nasopharynx are sufficient to inflate the ear during swallowing with the patient in the erect position.

Politzer believed that the tube opened during swallowing because a vibrating tuning fork held in front of the nose until it could no longer be heard could again be heard upon swallowing and his observation had been universally accepted.

Dr. H. B. Perlman[4] of the University of Chicago has investigated this problem among others by recording the sound transmitted through the eustachian tube to the middle ear and found that normal individuals varied, the tube apparently opening in some and requiring definite pressure differences in others to produce opening during swallowing as reported by Zöllner. The entry of air into the ear was determined by the auscultation tube or observation of the drum.

Perlman, by using a simple mercury manometer, confirmed Hartmann's observations that 20 to 40 mm. Hg. positive pressure are necessary to inflate the ear by Valsalva's maneuver. Also he found that exercise temporarily reduced the pressure required, while on assuming the prone position the necessary pressure was greatly increased so that almost no one was able to inflate the ears in this way.

This test was adapted by Perlman as a means of objectively demonstrating the condition known as "abnormal patency."

Another method for obtaining information on eustachian tube function, by measuring the pressure differences between middle ear and outer air is the "pneumophone" described and used by Van Dishoeck[8] of Amsterdam.

This consists of a water manometer connected with the outer ear, along with a transmitted tone of constant intensity so that the hearing can be tested during alterations in pressure.

He found the hearing is normally best when the pressures are within a range of 4 cm. of water while greater differences produced impairment.

By this method existing pressure in the middle ear can be estimated by the increase or decrease in pressure in the outer canal necessary to obtain the best hearing, and the difference in pressure thereby determined gives an index of tube function.

Armstrong and Heim[1] at Wright Air Field have reported detailed observations during ascent and descent, made in the pressure chamber, confirming in principle the observation made earlier by Hartmann. They found that during ascent the tubes spontaneously open at an elevation of 500 feet corresponding to a decrease of 15 mm. Hg. pressure below that at sea level and again at each additional 435 feet of elevation.

On descent the tubes do not open spontaneously. Swallowing, yawning or a similar movement of the palate is necessary to allow equalization of pressure. Lacking such action, when the outer pressure increased to 90 mm. Hg. above that of the middle ear the tube cannot be opened voluntarily by swallowing. At still greater pressures the drum may rupture.

The application of these facts to commercial aviation is that inconvenience is likely to be caused to passengers with poor eustachian tube function during rapid descent and consequently the ratio of descent has been limited to 500 feet per minute by the CAA.

During sleep swallowing occurs only about once per minute and sleeping passengers are likely to have more difficulty during rapid descent. The same applies to unconscious individuals. These physiological facts apply in the same way to caisson workers and divers. Congestion of the tubes during a cold may make it impossible for the individual to tolerate the customary rate of increase in pressure and the individual is incapacitated on that account.

Diseases Due to Rapid Changes in Air Pressure

I. *Acute Aero-otitis Media.*

This term has been coined by Armstrong and Heim to indicate the middle ear disturbance resulting from failure of the eustachian tube to open during an increase of outer air pressure.

After the negative pressure in the ear reaches 80 or 90 mm. Hg. relief is obtained only by returning to the higher altitude. Trauma may already have been produced, however, in which case the symptoms will persist after the pressure is equalized. The trauma may consist of acute congestion of the middle ear mucosa, hemorrhages in the mucosa or into the cavity or exudation of clear fluid. Symptoms vary from a blocked up feeling in the ears, to discomfort, pain and deafness. The hearing loss due to difference in air pressure alone affects mainly low tones but as fluid fills the middle ear higher tones are also affected. The Rinne test is negative. Objectively the drums are retracted and vessels are injected presenting an appearance similar to an infectious process but suppuration does not occur.

Treatment consists in inflation to equalize pressure, local heat, and shrinkage of the tube opening.

Prophylaxis consists in: (1) selection of personnel with normal tube function; (2) proper instruction regarding opening the tubes; (3) limit flying during acute upper respiratory inflammation.

II. *Chronic Aero-otitis Media.*

It is fairly common to find that individuals subjected to repeated aural trauma, as in caisson workers, divers and aviators, develop chronic symptoms of stuffiness, head noises, and difficulty in clearing the ears by efforts to open the tubes.

Objectively some degree of retraction and thickening of the drums is evident. The type of deafness, however, is apparently a combination of conduction and inner ear types. The inner ear type is known to exist in caisson workers who have not been exposed to acoustic trauma but in the case of fliers the chronic hearing impairment is likely to be due to two factors, inner ear damage from repeated acoustic trauma and middle ear changes from inadequate tube function.

Treatment consists in removal of predisposing factors such as chronic inflammations in the nose and throat and possibly treatment for relief of tubal stenosis.

Tests for Tubal Function

The need for accurate means of estimating tubal function has become apparent with the increase in aviation. The methods which have been available for many years have been: (1) Valsalva's maneuver, using the auscultation tube or watching the drum for bulging; (2) swallowing to see if the bulge is relieved; (3) if the bulge doesn't disappear, as may occur if the pressure difference is too small, trying Toynbee's maneuver; (4) if both maneuvers fail Politzeration may be done during phonation or swallowing and if this fails, the eustachian catheter may be tried.

These methods have given fairly dependable information in experienced hands but in more recent years more accurate methods have been developed for determining tubal function under certain conditions. The method described by Zöllner, to measure the pressure needed to open the tube during swallowing, and the pneumophone, by Van Dishoeck, for estimating middle ear pressure, represent improvements designated to obtain reliable objective information.

Perlman has recently devised an apparatus based on a combination of that of Zöllner and Van Dishoeck so that an objective measurement can be made of: (1) the pressure necessary to open the tubes by Valsalva's maneuver; (2) the pressure necessary to inflate the ear during swallowing; and (3) the degree of positive or negative pressure existing in the middle ear. The performance of inflation by a measured amount of positive pressure in the nasopharynx during swallowing accomplishes at the same time the objective of inflating the ears in a simple controlled manner, not unpleasant, without the need of instrumentation. The apparatus which will be described by Perlman along with detailed observations in the near future, seems to promise a more accurate and simple method of evaluating tubal function.

Diseases Arising from Impaired Tubal Function

The clinical conditions which have their basis in a disturbance of function of the eustachian tube can be divided into three classes: (1) abnormal patency; (2) acute inflammatory processes affecting the tube and middle ear; (3) chronic inflammatory conditions of the tube and middle ear.

The question of acute and chronic suppuration of the middle ear spaces and the deafness resulting therefrom does not come within the scope of this discussion and is therefore not covered except for occasional reference.

1. *Abnormal patency.*

Jago[3] of Cornwall in 1867 and Rumbold[5] of St. Louis in 1873 gave accurate descriptions of this condition. Perlman[4] presented further observations in 1939. Under normal conditions the tube is closed with sufficient firmness to protect the ear against common pressure changes in breathing, sneezing, and coughing as well as the acoustic oscillations incident to the same actions and to speech.

Abnormal patency may vary from the continuously open tube to that which opens more easily than normal. The former condition exposes the ear to the pressure changes in the nasopharynx and the drum may be seen to move out and in with respiration and a blowing sound heard through the auscultation tube. The nasal sounds "in," "m," "ing" can be clearly heard with the diagnostic tube (autophony). In tubes with a lesser degree of abnormal patency the tube may remain open only at intervals or during sneezing and nose blowing which causes considerable discomfort. Hearing is impaired while the tube is open, due to masking effect of the noise from the pharynx.

The condition is not frequent. It is likely to be found in thin individuals, particularly women who have lost weight. A recent case was observed in a young woman in the later stages of pregnancy, persisting for some months afterwards. It is a common occurrence after retrogasserian neurectomy of the fifth nerve.

Such patients characteristically hear well when they lie down, since the tubes close when they are in the recumbent position.

Treatment of such patients is limited to the use of the eustachian catheter and such medicaments as will stir up a mild inflammatory reaction, for example, insufflation of boric and salicylic acid powder.

Restoration of weight loss may relieve the condition in some cases.

2. *Acute eustachian salpingitis, acute nonsuppurative otitis media, acute bullous myringitis (myringitis bullosa).*

Acute eustachian salpingitis is diagnosed mainly on the subjective complaint of a stopped-up

feeling in the ear or, in the case of a deaf person, an increase in deafness during a head cold or acute inflammatory reaction in the nasopharynx and nose, while there are still no recognizable changes in the drum.

The hearing loss may be difficult to demonstrate objectively, but measurement with the "pneumophone" of Van Dishoeck may show abnormal pressure in the middle ear.

The process represents the first stage of extension of an inflammatory process from the nasopharynx and is still reversible. Treatment is directed to the upper respiratory condition with warning against strenuous nose blowing. Elevation on pillows with the affected ear up during sleep helps reduce congestion.

Acute nonsuppurative otitis media represents an extension of the inflammatory process into the middle ear, producing recognizable changes in the drum. The inflammatory process may still be arrested in this stage and restitution occur. In severe infections and with favorable predisposing conditions invasion by the infecting organism occurs. The tube then becomes blocked or incapable of carrying off the inflammatory products, and suppuration develops.

Impaired hearing and ear noises become pronounced as the middle ear is involved and pain may occur. The latter may be coincident with formation of bullæ in the drum, which are filled with serum or hemorrhage.

Treatment in this stage is directed to control of the infection within the nose and throat with no local interference in the ear except as necessary for relief of pain. Since it is a matter of great importance to prevent extension of suppuration into the middle ear spaces the use of sulfonamide therapy in this stage seems definitely indicated in selected cases. Such therapy must be carried out in adequate concentration with careful control of fluid intake and output, urine and blood examinations and observation for signs of reaction or toxicity. Usually treatment for about three days is sufficient and if given promptly in this stage, suppuration rarely develops. Elimination of predisposing factors such as adenoid hypertrophy in children or chronic sinus infection is an essential prophylactic measure after the acute stage.

Acute exudative catarrh is a variety of acute nonsuppurative otitis media which is fairly common. The middle ear and sometimes the whole air-cell system fills with clear fluid. The drum may show some injection but is mainly more

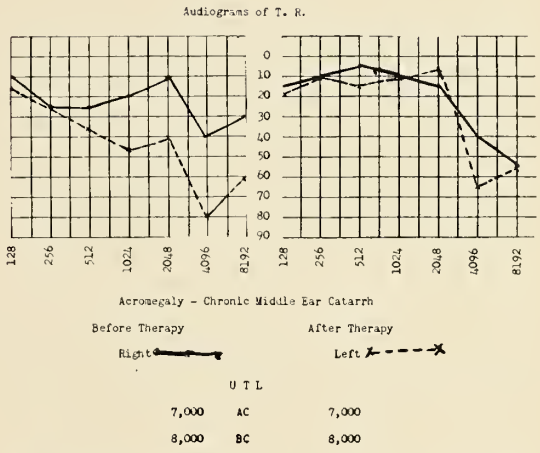


Fig. 4. Impaired hearing due to chronic nonsuppurative changes in the tube and middle ear (dry type) occurring in acromegaly. Impairment up to 2000 cycles is due to conduction loss. The high tone loss and lowering of upper tone limit (UTL) is to be explained partly by acoustic trauma, and probably partly by primary nerve degeneration.

transparent with the malleus appearing narrowed. Fluid lines are absent if the middle ear is entirely filled.

Hearing impairment for the voice is marked.

In cases of this type spontaneous resolution usually occurs. However, if some predisposing factor such as adenoid hypertrophy, chronic rhinitis or sinusitis is present the condition is likely to become chronic. It is my policy not to inflate or attempt to remove fluid from this type of ear until the fourth week. Most cases subside in the third or fourth week spontaneously. Before this time inflation alone gives only temporary relief while the removal of the fluid by puncture of the drum and inflation may introduce infection and suppuration.

Bullous myringitis is another division of nonsuppurative otitis media, in which the formation of bullæ on the drum filled with serum, sometimes with hemorrhage, is the chief local change. Pain occurs, and slight discharge with rupture of bulla. This condition is said to be more characteristic of influenza infection, but is commonly seen in other types.

Chronic Tubal Obstruction and Nonsuppurative Otitis Media

Under this general heading two distinct types may be differentiated: (1) dry catarrh, chronic adhesive processes, et cetera; (2) wet catarrh or chronic exudative catarrh.

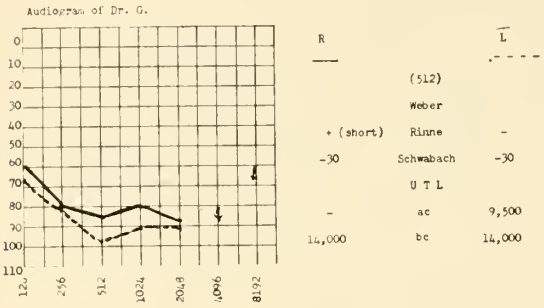


Fig. 5. Marked deafness due to chronic suppuration bilateral now healed. Eustachian tubes stenosed. Marked relief from tinnitus follows bouginage and inflation. Uses a hearing aid.

Dry Catarrh.—Under group 1 is included those cases of chronic conduction deafness occurring as a result of recurring inflammatory attacks, some of which may have been suppurative, others nonsuppurative.

The pathological process consists of varying degrees of impaired eustachian tube function, thickening, retraction, and scarring of the drum and fibrotic adhesions involving the conduction apparatus.

Deafness varies with upper respiratory infections and is temporarily improved subjectively and objectively by inflation of the middle ear (Fig. 5). Treatment consists in correcting any predisposing factors in the nasopharynx and nose such as hypertrophied adenoids, chronic nasal and sinus disease. Children seldom require more than removal of the cause of the tubal obstruction but in the adult varying degrees of stenosis may have developed, and some improvement in tubal function may be obtained by judicious use of bouginage. Patients may experience enough relief from tinnitus and hearing impairment to warrant periodic treatment (Fig. 6).

Chronic Exudative or Wet Catarrh.—This type is characterized by a persistent or recurring collection of fluid in the middle ear and its connecting air spaces. The fluid completely fills the middle ear and fluid lines are not visible. Diagnosis can be made on the appearance of the drum, the distinctive signs being the increased transparency of the membrana propria due to the fluid medium against its inner surface and a consequent narrowing of the handle of the malleus which then appears as a thin chalky line broadened at the umbo.

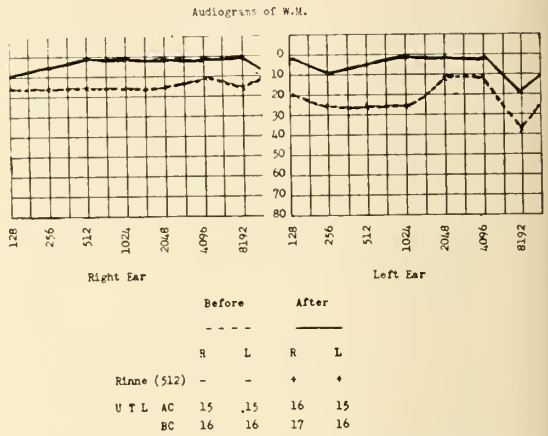


Fig. 6. Bilateral chronic exudative catarrh in child of 3 years. Spontaneous disappearance of the fluid within one month after adenoidectomy and tonsillectomy.

Deafness is of the conduction type with a greater loss for high tones than in simple dry catarrh or early otosclerosis.

The direct cause of this type is an abnormal degree of tubal obstruction, indicated by its consistent appearance in obstruction by nasopharyngeal tumor, and its frequency in cases of obstructing adenoids.

The negative pressure theory of Politzer and Zaufal offers the best explanation of the replacement of air in the middle ear spaces by fluid and is supported by the finding of a negative pressure by the pneumophone. The fluid is usually thin but sometimes becoming viscid, suggesting a high mucinous content. The condition is found most frequently in children due to obstruction of the tubes by adenoids. It is also characteristic of nasopharyngeal tumor, and may occur in chronic sinusitis or rhinitis. Some individuals have recurrent attacks with upper respiratory infections, probably on the basis of chronically impaired tubal function.

In children the removal of the predisposing cause is usually followed by spontaneous recovery of the ear in three to four weeks (Fig. 7). Removal of fluid from the middle ear by puncture and inflation of the tube is rarely necessary.

Bilateral deafness of this type is usually de-

tected in the child either at home or in school, but it is a frequent occurrence that unilateral deafness of this type will be undetected or neglected for years unless the other ear also becomes impaired.

With the almost universal use of sulfonamides during acute infections, suppurative disease of

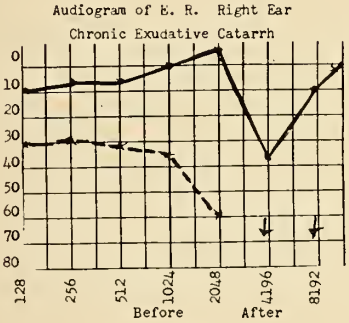


Fig. 7. Recurrent chronic exudative catarrh due to chronic changes in the eustachian tube. The orifice appears normal. The broken line shows the hearing threshold before and the solid line after the removal of the fluid from the middle ear. Recurrence tends to occur in two to three weeks.

the ear is frequently prevented or cured, but a residual unilateral deafness may be neglected, partly because the young child does not complain and partly because the local signs exhibited by the drum will only be recognized by the trained observer.

While removal of the obstructing adenoids or relief of a sinus infection usually results in spontaneous recovery in the child, the adult may not respond so well, probably because of chronic changes in the tube, and may require aseptic puncture of the drum and inflation to expel the fluid. A dramatic improvement in hearing follows, but recurrence is likely unless causative factors are corrected.

In conclusion it may be emphasized that attention to those factors which impair function of the eustachian tube in the childhood stage offers the chief means at the present time of prevention of deafness in later life.

The development of new and refined methods for determining eustachian tube function will contribute much to the improvement in diagnosis and intelligent management of this problem.

References

1. Armstrong, H. G., and Heim, J. W.: Effect of flight on the middle ear. Jour. A.M.A., 109:417, (Aug. 7) 1937.
2. Hartmann, A.: Experimentelle Studien über die Funktion der Eustachischen Röhre. Leipzig: Vert. u. comp., 1879.
3. Jago, J.: Brit. and For. Med. Chir. Rev., 34:175 and 496, 1867.
4. Perlman, H. B.: The eustachian tube, abnormal patency and normal physiologic state. Arch. Otolaryng., 30:212-238, 1939.
5. Politzer, A.: Textbook of the Diseases of the Ear. Ed. 3, translation by O. Dodd. p. 63. Philadelphia: Lea Brothers and Co., 1894.
6. Rumhold, T. E.: The Function of the Eustachian Tube. St. Louis: Southwestern Book and Publishing Co., 1873.
7. Toynbee, J.: Proc. Roy. Soc. London, 6:286, 1853.
8. Van Dishoeck, H. A. E.: Negative pressure and loss of hearing in tubal catarrh. Acta Oto-laryng., 29:303, 1941.
9. Zöllner, F.: Archiv. f. Ohren-Nasen-u Kehlkopfh., 140-137, 1936.

ACUTE SUPPURATIVE OTITIS MEDIA—A RECONSIDERATION

CHARLES E. CONNOR, M.D.

Saint Paul, Minnesota

THE tympanic cavity has acquired new significance in recent years as the result of anatomical research upon the pneumatic system of the temporal bone. Time was when the cavum tympani was considered an anatomical entity, and acute suppurative otitis media an inflammatory reaction therein. The mastoid process was another anatomic unit and its involvement was recognized as mastoiditis. Acute infections started in the middle ear; if not controlled, the adjoining unit, the mastoid, was involved and mastoiditis was added to the otitis. The process was considered one of progression, principally by continuity of tissue, in which the cavum tympani was simply the first in a series of anatomical structures to be involved in the suppurative process.

We now realize that, instead of playing this restricted part, the tympanic cavity has a much wider rôle, carrying with it numerous and important relationships; it is the central receiving and distributing point for infection attacking the temporal bone through the eustachian tube. We regard it as the key point in the complicated air-cell system of the temporal bone, all of which has direct relationship with the tympanic cavity.

Presented in Symposium on Eye, Ear, Nose and Throat Diseases at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 1, 1942.

An acute suppurative otitis media involves not only the tympanic cavity but also, to a varying degree, other portions of the pneumatic system, so that the entire temporal bone is implicated; fortunate it is for us that, in most cases, the involvement of distant air-spaces is not severe, often not exceeding a mild hyperemia which tends to spontaneous resolution unless there is interference with ventilation and drainage at some bottle neck, with subsequent retention and infection.

The anatomy of the temporal bone is of more than academic interest, for upon it depends the incidence and course of many of the complications of acute suppurative otitis media and the incidence and location of chronic suppurative lesions. It has been pointed out that, in a pneumatic bone, infection involves the entire cell system to a certain degree, often so slight that spontaneous resolution occurs; when this does not follow we have the development of a clinical entity, mastoiditis, petrositis, involvement of the squamous temporal or zygomatic root. This is usually due to poor drainage, either because the communicating passages are naturally small or because they have been narrowed as the result of previous inflammation.

The intimate contact of air cells with marrow in the diploetic bone is conducive to osteitis and osteomyelitis. The membrane of the small air-cell system is, according to Wittmaack,[3] theoretically less resistant to infection; one may, however, have the involvement of distant cells and interference with drainage seen in the pneumatic bone. One is more apt to find at operation a softened necrotic bone with small cells filled with granulation tissue than the cavitation seen in well-pneumatized bone.

The sclerotic or infantile bone differs from the foregoing in that an acute suppurative otitis media is not so widely disseminated throughout the entire bone and complications so characteristic of pneumatic bone, mastoiditis, petrositis, are not frequent. The lack of a cellular system is apt to localize infection in the middle ear, and if retention does occur, it may be followed, as pointed out by Maxwell and Brownell,[1] by thrombosis of venules in the mucosa, local necrosis of the mucoperiosteum, and ultimate development of localized osteitis in the region of the attic, aditus or antrum.

The pathology of acute suppurative otitis media is fundamentally that of acute inflammation of any tissue, but there are modifying factors which influence the incidence of complications and the development of chronicity. The most important of these is retention. The longer the products of inflammation are dammed back in the middle ear the greater is the probability of local necrosis and involvement of distant air cells. This retention is caused by late drainage, either myringotomy or spontaneous rupture, both of which, but especially the latter, may be inadequate. A previous otitis may be responsible for a thick fibrous drum, slow to rupture, or a fibrous, avascular submucosa, less able to resist infection. Either or both may be etiologic in the production of chronicity. Maxwell and Brownell have shown that retention in the mastoid of pus under pressure tends to thrombosis of small vessels in the mucosa of the septæ, interference with blood supply, and ultimate bone necrosis. It seems to me entirely logical to assume that prolonged pressure in the middle ear may well interfere with circulation, cause local necrosis of the mucoperiosteum, and so lay the groundwork for a later chronic suppuration. One may well say then that retention is the key factor in the progress and prognosis of middle ear suppuration and of the incidence of its sequelæ.

Bacteriological studies of acute suppurative otitis media are numerous, many of them based on large amounts of material, carefully studied. These show the same fairly small group of organisms to be responsible, although their relative importance varies. This is to be expected, because we know that organisms responsible for respiratory infections vary from season to season, not only in incidence, but also in clinical manifestation, that is, predilection for certain tissues and types of complication.

The various streptococci, pneumococci and staphylococci play the predominant rôle, with the hemolytic streptococcus and pneumococcus III the most apt to cause serious lesions. None of these organisms, with the possible exception of the latter, is characterized by a clinical picture clear enough to permit its recognition. Occasionally an organism, not ordinarily virulent, may acquire unusual properties and produce the severest type of infection.

The bacteriological study of acute suppurative otitis media has acquired new significance since the introduction of the sulfonamides; these po-

tent drugs cannot be intelligently used without knowledge of the organisms causing the lesion. One occasionally sees acute suppurative otitis media of such threatening aspect that immediate use of a sulfonamide, preferably sulfadiazine, is warranted without waiting for a report on cultures; when this is secured, therapy may be modified if necessary.

The various methods of culture vary considerably in their efficacy; they may be taken from the external canal, from the myringotomy knife, or from the postnasal space in the vicinity of the tube. Cultures from the external canal are least reliable, the responsible organism being frequently overgrown by contamination; the longer the ear has been discharging the more apt is this to be the case. Cultures from the myringotomy knife are most apt to yield the responsible organism and do so in a high percentage of cases; those from the region of the pharyngeal end of the tube are also reliable and show the same organism as the myringotomy knife in a large percentage of cases.

There is no disease more protean or unpredictable in its clinical manifestation than acute suppurative otitis media. Certain patterns are familiar. The disease may start with mild symptoms, slight temperature, little pain and but mild injection along the hammer handle, and gradually increase in severity until a full-blown otitis requiring myringotomy is present. Or this same general course may be followed but never reach the point where intervention is necessary; there may be a small amount of purulent exudate behind the drum, but the absence of temperature and pain makes drainage unnecessary.

There is the fulminating type, starting in the mesotympanum or in the attic, but soon involving the mesotympanum, running a rapid course with high temperature, severe pain, prostration, and retention requiring early drainage. A type frequently seen is one which remains localized in the attic, with redness and swelling of Shrapnell's membrane, symptoms of moderate severity, running a slow course and finally subsiding spontaneously.

There is the necrotic type, fortunately rare, seen occasionally in scarlet fever, characterized by necrosis of drum, ossicles and occasionally the deeper bony structures of the ear, e.g., the labyrinth. And finally there is the acute otitis with early symptoms of sepsis, as evidenced by chill, peaked temperature, and prostration, fulminating from the beginning, and requiring our utmost efforts in diagnosis and therapy from the start.

One cannot tell, in the early stages of an acute otitis media, exactly what the course will be. Cases starting slowly with the comparatively mild symptoms may run a long course and ultimately develop mastoiditis or blood stream involvement; fulminating cases may quiet down quickly after myringotomy and behave very well. Daily supervision is necessary to prevent the disagreeable surprise of finding a situation much worse than anticipated.

Laboratory aids are important in the diagnosis and treatment of acute suppurative otitis media. The complete blood count with Schilling hemogram helps greatly in estimating the severity and course of the disease. The hemoglobin reading is important, especially in hemolytic streptococcus infection; a constant drop means an uncontrolled infection, as does a steadily mounting band count, or shift to the left, in the hemogram. Some surgeons of wide experience have felt that they could base operative indications on the band count, considering one of over 16 per cent as calling for surgical interference. My own opinion is that the band count, while helpful and important, is not, in itself, an indication for surgical treatment.

Blood cultures are important whenever sepsis is suspected; a negative culture or a series of them does not rule out sepsis, but a single positive establishes the diagnosis beyond doubt.

The determination of sulfonamide blood-level is important, especially in gravely ill patients or when large doses are being given. Estimation of dosage based on body weight is often the only method available, but any patient who is so seriously ill as to require intensive therapy should be hospitalized for accurate determinations.

X-ray studies are usually not indicated in the early stage of a suppurative otitis media unless there is evidence of an early mastoiditis. The mastoid and petrous tip will almost always show some clouding of the air cells and blurring of the septæ in the early stages; it is only later, in ten to fourteen days, that one expects to find definite evidence of mastoid involvement. Decalcification calls for close observation; bone destruction is a definite operative indication.

The sulfonamides have introduced an element of uncertainty into the x-ray picture of acute

suppurative otitis media in that the increased transparency of the bone caused by them tends to minimize the changes taking place, resulting in misleading x-ray findings, in that they do not reveal the true condition. This, in clinical terms, means that, in those with suspected mastoiditis who have received sulfonamides, one must be prepared to operate on patients in whom the x-ray findings do not appear to justify operation. A healthy, normally pneumatized bone is often helpful in judging the changes in the case under observation.

Even as retention is the pathological keystone in changes developing in middle ear suppuration, so it is the central point of attack in all therapy of the disease; of the many things done, only a few are helpful, their efficacy depending on the extent to which they control retention.

Medication in the external canal is, with one or two exceptions, futile. Carbolated glycerine is one of the commonest; any ear so treated should be closely observed because this preparation, while undoubtedly relieving pain, often acts as morphine in acute appendicitis, e.g., the patient is more comfortable but the lesion progresses. From a purely diagnostic point of view, it were better not to use analgesics in acute middle ear disease, because pain is here, as in many other conditions, a valuable guide. Demands, however, for relief of pain usually make such preparations necessary.

Alcohol is useful in cleansing (not sterilizing) the canal before myringotomy. Its use in an acute, discharging ear, as with the local use of various dyes and antiseptics, is completely futile; a moment's consideration will show this to be true. It is quite impossible for any liquid dropped into the external canal of an acutely inflamed ear to pass through a drum opening almost closed by swelling and through which purulent discharge is pumping under pressure, and to diffuse itself throughout an inflamed middle ear full of pus. Many things have been so used, but I am convinced that the good results reported represent the natural tendency of 90 per cent of cases of acute otitis to spontaneous resolution.

Various methods of promoting drainage have been recommended; of these, the use of dry gauze wicks might be helpful, did it not require the constant attendance of one especially trained in the technique and did not the frequent manipulation open the way for skin infection. Drywiping helps to keep the canal from being blocked, but does very little to facilitate drainage. Routine irrigations are to be avoided, because they macerate drum and canal and open the way for skin infection. Only occasionally, when pain cannot be otherwise relieved or when drainage is blocked by closure of the drum opening or by filling of the canal fundus with thick secretion, is hot irrigation called for; under these conditions it may be most helpful.

Heat in any form is useful. Hot moist packs are especially effective, but any of the usual agents, dry heat, infra-red, may be used.

X-ray, if used early and in light dosage, often seems to relieve the pain and favorably influence the course of the disease.

The sulfonamides have posed new problems for the otologist, both in the selection of cases for treatment and in the administration of the drug. As yet, there is no generally accepted method of procedure and diametrically opposite techniques are advised by men of equally wide experience.

That the use of these drugs has effected marked changes in the incidence and course of suppuration in the temporal bone, no one will deny; the exact extent and reason for these changes is not so easily defined. There is no doubt that the sulfonamides are widely and indiscriminately used in all types of head and ear infection. This undoubtedly has prevented the development of otitis in many cases of respiratory disease—how many no one can say. The lessened occurrence of middle-ear suppuration means lessened mastoiditis and intracranial complications.

The sulfonamides are variously used by men of wide experience. Some give them as soon as a diagnosis of otitis media is made and continue adequate dosage for from five to seven days. This method is based on the theory that the drug is most effective when used in the presence of good blood and oxygen supply, in the absence of peptones and disintegration products of leukocytes, and not in bony tissue; hence its use when the infection is limited to the mucosa where these conditions are fulfilled, and before it has had time to invade bony structure. Any effectiveness the drug possesses should be manifested in the time mentioned.

Others advocate giving the drug early and continuing its use until the otitis is cured or mas-

toiditis develops. This means that one must be prepared to continue its use for three weeks, the average time of discharge in 67 per cent of cases. This, to my mind, is not desirable, because of the latent danger of kidney and blood damage, sometimes cumulative. I have seen sulfanilamide used with every safeguard over a period of three weeks, only to have the clinical picture change almost overnight, with the development of a very marked and alarming neutropenia, which responded to no treatment whatsoever and proved to be permanent. This method of administration is based on the theory that discharge means infection, which is, of course, true, and that infection calls for the use of sulfonamides, which is not necessarily true.

A third method is to wait, if possible, for a period of ten days, and then, if there are disturbing symptoms, to use these drugs. This, to my thinking, is not a completely rational procedure, inasmuch as the sulfonamides are, theoretically at least, most effective in the early days of the disease. It is advocated by those who feel that these drugs mask the course of an otitis and that but few complications occur in the early days of the disease.

The development of meningitis or sepsis is, at any time, an absolute indication for the sulfonamides, but if mastoiditis, petrositis, or extradural abscess develops, the best opportunity for their control has been lost. If bone necrosis or abscess develops, the sulfonamides have nothing to offer. Followed to its logical conclusion, this method means withholding the drug until complications have occurred, which is, in fact, the method of use advocated by still another group of writers, who point out that 90 per cent of cases of suppurative otitis media recover spontaneously and that the sulfonamides, being the potent drugs they are, should be reserved for cases developing complications. It seems to me that, of these three techniques, the early administration of the drug is best supported by theoretical considerations, offers the greatest chance of benefit, and is attended by the least danger.

When one inquires more particularly into the results of sulfonamide therapy in acute suppurative otitis media, one again enters a field where definitive conclusions are hard to draw. Even as one encounters diverse opinions regarding the indications and technique of use of these drugs, so one finds the most divergent opinions regarding their effects. Some authors feel that the results are quite definite and satisfactory in that the duration of the discharge and incidence of complications are lessened. Others find these aspects of otitis but little influenced. Statistics are cited to substantiate each position. One of the recent critical studies on this point is that of Henry L. Williams[2] and associates of the Mayo Clinic, who found, among other things, that duration of discharge was but little influenced by the sulfonamides, that surgical mastoiditis occurred somewhat less frequently (by 14 per cent) in cases of hemolytic streptococcus receiving these drugs than in similar cases not so treated, that this difference in favor of the sulfonamides was increased to 17 per cent when only adequately treated cases were included in the study, that the incidence of surgical mastoiditis was much less (by 21 per cent) in cases of diplococcus pneumoniæ properly treated with sulfonamides than in similar cases not so treated, and that in 12 per cent of cases of hemolytic streptococcus infection, specific therapy was discontinued because of the development of anemia or leukopenia.

Two further points made by Williams are important. Patients who have been receiving sulfonamide therapy do not appear to develop biologic resistance to their infection. If surgical intervention becomes necessary, several days should elapse after chemotherapy is discontinued before operation is instituted. The other point, quite important, is that patients with acute suppurative otitis media should be treated in a hospital for proper supervision of the treatment.

The fact that treatment had to be stopped in 12 per cent of cases of hemolytic streptococcus infection because of the development of anemia or leukopenia serves but to stress the fact that the sulfonamides are potent drugs and should be used only on considered indication and with careful check. Not alone is there danger of damage to the blood-forming organs, kidneys, liver, skin and nervous system, but there is another danger, important because of its insidiousness: use of the sulfonamides may so mask the progress of the disease that its true status is not appreciated until the sudden appearance of some complication such as mastoiditis, extra- or subdural abscess or meningitis. The clinician must learn an entirely new set of indications for surgical interference; he must be prepared to operate on what would formerly have been considered insufficient indica-

tion, and he must be prepared to find the condition worse than clinical or x-ray studies would indicate; this is especially true in coalescent mastoiditis.

A word about another danger inherent in the use of the sulfonamides. Both laity and profession have acquired an almost naive confidence in these drugs so that they have an unwarranted feeling of security as long as such therapy is used and neglect necessary observations and studies.

How can one, in the presence of such a mass of confusing evidence, work out satisfactory indications for the use of the sulfonamides in acute suppurative otitis media? Certain truths have been demonstrated. Inasmuch as these drugs work better in the presence of abundant blood and oxygen supply they should be used early in the course of the disease, as soon as the diagnosis is made. So used the above requirements are fulfilled and complications are not masked. Also proved is the value of sulfonamide therapy in the complications of acute suppurative otitis media. Obviously, it should be used in such situations and pushed to the limit of the patient's tolerance. There remain certain other situations which call definitely for the sulfonamides. Maxwell and Brownell summarize them as follows: Any case of acute suppurative otitis media, fulminating in character, with signs of early mastoid involvement and accompanied by sepsis, profuse discharge, pain and mastoid tenderness; cases secondary to virulent infection in the upper respiratory system; early, acute rapidly-developing middle ear infections, characterized by a red, edematous tympanic membrane and thin, seropurulent or serosanguinous exudate under pressure in the tympanum; and all cases of acute suppurative otitis media due to the pneumococcus.

Even as retention is the central factor in the pathological aspects of middle-ear suppuration, so is its relief the key point in treatment. The sooner retention is relieved the better the course of the disease; the longer retention persists, the more likely a prolonged or complicated course.

Relief of retention may be either through spontaneous perforation or myringotomy; the former is more apt to be inadequate, the latter, when well performed, gives optimum drainage. Drainage may be early or late, by which we mean early enough in the course of the disease to exercise its maximum therapeutic effect, in the first three, or preferably two days, or whenever gas or fluid under pressure can be released by myringotomy. Drainage may be late, by which we mean so late in the course of the disease that its maximum benefit will not be received and damage may be done by pressure of fluid in the middle ear or backing up of secretion into contiguous air cells.

One of the best studies of the drainage question in acute suppurative otitis media is presented in a recent paper by Maxwell and Brownell of the University of Michigan, already referred to. Their conclusions from a group of 1,514 cases may be summarized as follows:

1. Late drainage (spontaneous perforation or late myringotomy) increases the incidence of surgical mastoiditis and of its complications and mortality.

2. Spontaneous perforation tends to come late rather than early, especially in children under ten, and increases the incidence of secondary myringotomy and surgical mastoiditis.

3. Early drainage varies directly with the age, and is less frequent in infancy and childhood; late drainage varies indirectly with the age, and is less frequent in later life.

4. The mortality rate increases with age in both septic and non-septic cases; a sharp increase occurs after sixty in non-septic cases and after twenty in septic cases.

5. Serious complications (parasinus and epidural abscess) and mortality rate are higher in septic than nonseptic cases.

6. Associated constitutional disease, especially nephritis and diabetes, increases the incidence of sepsis and the mortality.

The role of drainage and of methods used to effect it in acute suppurative otitis media may be summed up by saying that the earlier drainage is established, the more effective will it be in controlling the course of the suppuration, lowering the incidence of mastoiditis, complications and mortality; the later it is established, the less influence it has on the course of the suppuration, complications, the need for operation, and mortality. And, of course, it goes without saying that drainage, no matter how early or efficient, does not prevent surgery and complications or the need for operation.

The fact that over 90 per cent of cases of acute suppurative otitis media recover spontaneously suggests that the mortality rate is very low, espe-

cially in nonseptic cases. The figures show a mortality of 2.24 per cent in 729 cases of nonseptic otitis media and of 28.7 per cent in 167 cases of otitis media with sepsis. It must be remembered that these figures come from a university clinic, where many, if not most, of the cases are seen late. I am very sure that the mortality in cases seen early and adequately treated is less.

There is no doubt that the incidence of both acute and chronic otitis media has diminished greatly in the last two decades; for this a number of factors are responsible. Both laity and profession are more ear conscious and aural symptoms receive earlier and more adequate attention than in former years. The control of the acute exanthemata in infancy and childhood is another important factor, as are the wholesale tonsil and adenoid operations performed during the last twenty-five years. And now, the universal use of the sulfonamides has undoubtedly, but to an unknown extent, still further lowered the incidence of ear infections.

Much can be accomplished to still further lower the incidence of otitis. Public health education in the care of acute upper respiratory infections, in the significance of aural symptoms, and in the proper use of the handkerchief, is important. Instruction in the proper methods of swimming and diving are essential. Excessive indulgence in these sports, especially under-water swimming or prolonged swimming with chilling and lowering of body resistance, is harmful. Swimming with a drum perforation is inadvisable. Finally, those working in the field of otolaryngology have a peculiar responsibility in making sure that they do not induce otitis in patients under their care, by too vigorous inflation of the ear with resultant drum rupture, by irrigating an ear without ascertaining the integrity of the drum, and by care in the use of nasal irrigation and of nasal tampons.

Bibliography

1. Maxwell, J. H., and Brownell, D. H.: Acute suppurative otitis media: A statistical study of 1,514 cases, of which 896 were surgical. Ann. Otol., Rhin. and Laryng., 49:973, (December) 1940.
2. Williams, H. L., and coworkers: Sulfonamide therapy for acute otitis media and mastoiditis. Ann. Otol., Rhin. and Laryng., 50:336, (June) 1941.
3. Wittmaack. Quoted by Diamant, Marcus: Otitis and air cell systems. Arch. Otolaryng., 34:24, (July) 1941.

STAPHYLOCOCCIC CONJUNCTIVITIS

T. R. FRITSCHE, M.D.

New Ulm, Minnesota

STAPHYLOCOCCIC conjunctivitis is a catarrhal inflammation of the conjunctiva usually more marked in the lower palpebral and bulbar conjunctiva and in the region of the caruncle. It is often bilateral and has scanty to moderate amount of discharge, is frequently accompanied by obvious lid infection and usually characterized by a mild and very protracted course with exacerbations, although it may be acute and severe and in many cases is accompanied by diffuse punctate superficial corneal opacities, and less often by catarrhal ulcers.

The causal organism is a spherical non-motile Gram-positive cell arranged in grape-like clusters on solid media and shows great variation in its biochemical activities, hemolytic power and pathogenicity. On agar the growth is orange, yellow or white. It is usually non-pathogenic, but some strains have the power of producing a powerful exotoxin to which humans may become allergically hypersensitive. When a staphylococcic infection becomes general and invades the blood stream, agglutinins occurring naturally in human plasma tend to localize the lesion. Drs. Allen and O'Brien stated that the toxic strains which incite conjunctival disease ferment mannitol, produce purple or yellow growth on crystal violet media, coagulate human plasma and liquefy gelatin.

The conjunctival sac is sterile at birth, but only about 30 per cent of adults have sterile conjunctivæ. This percentage varies widely as reported by different authors. The skin of the lower lid and the meibomian gland are the most frequent harboring place of the organism. Organisms introduced into the conjunctival sac generally lose pathogenicity and become attenuated because of the lower temperature, the lysozyme and sluicing action of the tears. However,

Presented at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 1, 1942.

when the eyes are bandaged, the temperature is increased and a perfect incubator is formed, which causes an increase in the number and virulence of the organism. Staphylococcic conjunctivitis is mildly communicable and trauma shortens the incubation period. The conjunctiva once infected seldom acts as a portal for general disease and therefore does not provoke a general humoral response.

The pathologic characteristics of staphylococcic conjunctivitis are essentially the same as in other forms of conjunctivitis and consists of a hyperemia, a stasis, and an exudation of cells and fibrin-rich edematous fluid. The exudation, after producing edema or even chemosis in some cases, filters through the conjunctival epithelium, mingles with the tears and various secretions of the conjunctival glands and constitutes the discharge. At first the flow of tears is reflexly increased, then goblet cells increase their discharge, giving it a mucoid appearance, and eventually the addition of inflammatory cells makes the discharge purulent. When capillary endothelium is injured severely by the toxins, red cells may escape by diapedesis and cause the discharge to be blood tinged. As the acuity subsides, lymphocytes and monocytes appear. From the tissue a lymphocytic response is provoked in the adenoid layer; later, plasma cells, histiocytes and finally fibroblasts appear. When the superficial cells with their turf of bacteria desquamate, the intensity diminishes. The deeper cells hasten their proliferation and themselves become phagocytic and thereby the new conjunctival stratum acquires a local immunity to the toxins.

In chronic stages there is an increase of mucus from the goblet cells and downward proliferation of the epithelial cells, especially of the palpebral region where the exudation in the subconjunctival tissue forces the epithelium into papilliform elevations. Between these elevations the most extensive mucoid changes occur, starting at the bottom folds and causing invaginations having the appearance of new glands, known as glands of Henle or crypts of Dubreuil. As the central cells degenerate, the mouths of these glands may become blocked, resulting in the formation of pseudoretention cysts, which may act as harboring places for the organisms. If the process is acute, they are purulent and appear as yellow points which may rupture or should be opened. In chronic stages these pseudocysts become calcified. These cysts are most common on palpebral conjunctivæ, but may rarely be found on the bulbar conjunctivæ and then usually contain a mucoid fluid.

The clinical course may be very acute and severe with edema and dermatitis of the lids. Pseudomembranes rarely occur. In the acute cases the eyes are congested, a mucopurulent discharge is present, the eyes are sensitive to light, have a scratching sensation and may be very painful during the time that the cornea is affected with a superficial keratitis of minute epithelial defects which stain with fluorescein. Mild iritis may at times be present. The lids are often red and thickened, and may have a distinct blepharitis. The conjunctiva of the lower lid, fornix and caruncle are congested and thickened, while that of the upper lid and bulb generally has a lesser degree of inflammation. As the disease becomes more chronic the symptoms subside, so there may be only variable degrees of thickening and congestion of the lower palpebral conjunctiva, fornix and caruncle. Discharge may be very scanty and noticeable only on arising. The lid margins may show variable degrees of redness or scaliness. Often the only symptom may be the inability to use the eyes for close work for any length of time.

Catarrhal ulcers which may occur during the course of the disease are often stubborn and have tendencies to recur. Many of them are corneal infiltrates which do not break down to actual ulceration. They are marginal almost without exception and have a tendency to become confluent. Perforations probably do not occur in pure staphylococcic infections.

The diagnosis is usually suspected by the clinical course, but should be verified by smear and culture. In my own experiences, culture seems the most reliable, as many smears, especially during the chronic stages, will show no organisms. For the average clinician the serum agar seems the most practical medium to use. The staphylococcic colonies can be recognized grossly. Some idea of pathogenicity can be obtained by the roughness or smoothness of the colonies and the amount of pigment. In general, the more pigmented and the smoother the colony and the more hemolysis on blood agar, the more pathogenic the organism. On serum agar, colonies of Morax Axenfeld bacillus, which also causes catarrhal ulcers, may be recognized grossly by the

characteristic pitted appearance of the colonies due to liquefaction of the media. One must remember that staphylococci, especially staphylococcus albus, is a frequently normal inhabitant of the conjunctiva or may be a secondary invader or contaminator.

Treatment is varied and consists of the usual antiseptics, applications of 2 per cent silver nitrate to the conjunctival surfaces of the lids, massage of the lids to express the meibomian glands, and use of hot compresses. In occasional cases, 5 per cent silver nitrate produces results when 2 per cent fails.

Before the advent of sulfonamides, the use of staphylococcus toxoid and vaccine was the most satisfactory treatment for stubborn cases and still should be used in severe or refractory cases, because it will cause a generalized antibody response as well as desensitize the individual to the toxin. Staphylococcus antiserum has been used with some success, but the average case hardly warrants its use. Massage of the lids in conjunction with 3 per cent ammoniated mercury ointment was very helpful, although more recently the sulfathiazole powder and now the ointment in 5 per cent strength seem preferable. Many cases respond to this dramatically, others in lesser degree and some show no response at all. Some cases seem to show slower response to this drug during recurrences, indicating the ability of some strains to develop a tolerance to the drug. Rarely an individual may show a reaction to the drug with an exacerbation of symptoms, usually an increased inflammation of the conjunctivæ and lids, with lessened discharge. This condition improves rapidly when the drug is withheld. The sulfathiazole ointment should be used frequently, up to eight times daily, and should be accompanied by gentle massage of the lids in chronic cases. Severe cases and those that have a tendency to recur should be treated with the vaccine or toxoid in increasing doses to establish an antibody titer sufficient to cure or improve the disease. Those cases which occur during the course of styes or chalazions usually respond to treatment of the primary condition. The serobacterin preparation containing both the antigen and the antibody seems in my experience to be the preparation best suited for the treatment of severe cases, especially those complicated with keratitis or catarrhal ulcers. This preparation is marketed in the form of the combined serobacterins of several strains of staphylococci and streptococci. In milder cases the toxoid or vaccine is sufficient to build up an antibody titer and also has a foreign protein effect.

Those cases complicated by the superficial corneal epithelial defects, if painful, may be treated by closing the eye with a patch, provided the discharge is scanty and the pad is removed frequently for treatment with hot applications, cleansing and instillation of antiseptic or sulfathiazole ointment.

Cases of catarrhal ulcer are treated as for severe uncomplicated staphylococcic conjunctivitis. In addition the ulcers should be cauterized with trichloracetic acid or other strong antiseptic, using Gifford's corneal probe with a wisp of cotton which is sparingly dipped into the acid. Atropine or other mydriatic is instilled when indicated and can be prescribed in a cod liver base which supplies the benefits of vitamin A locally.

Bacteriophage has been used with some success. It may cause an exacerbation of symptoms during the first day of use. My own limited experience with it did not warrant its use in preference to the sulfathiazole or toxoid.

Scobee in a series of eighteen cases of recurrent staphylococcic conjunctivitis had secured improvement in all cases using 1 to 5,000 aqueous solution of zephiran, four times daily and weekly massage of the meibomian glands.

Julianelle, Boots and Harrison, using toxoid as sole treatment in thirty cases of staphylococcic eye infection, concluded that toxoid is not an effective method of treating presumably staphylococcic eye infections.

Only ten of their cases showed improvement during the treatment and thirteen cases were asymptomatic after six months.

Presumably, a sensible approach to the treatment of staphylococcic conjunctivitis is not any one remedy for all cases, but different treatment or that combination of treatment which seems most suitable for each case. The elimination of local foci as meibomitis or infection in pseudoglands of Henle are important. Massage of the lids is helpful, especially if used in conjunction with antiseptics or sulfathiazole ointment. Probably the value of toxoid is also increased if some of the stagnating pockets of staphylococci are expressed from these glands at the time the antibody titer is rising. It is possible that dental infection may act as a sensitizing factor to the

toxin in rare instances. The use of vitamin A has been claimed to cure some cases of asthenopia, and it is possible that some of these cases may have been mild cases of chronic conjunctivitis which benefited from the generally increased bodily resistance following the use of vitamin A.

I have selected twenty-one cases, which were sufficiently stubborn to warrant more than average study. Of these, seven were staphylococcus albus, the others were staphylococcus aureus or citreus. Eight of these patients had recurrences. Only five were bilateral, which is contrary to most findings. Three of these cases followed a definite history of foreign body, a few others gave indefinite histories of starting after dirt or dust had blown into the eyes. Two patients had styes, three had obvious lid margin infection, and three had infected glands of Henle, which could be considered as possible cause of the infection. Five of the cases had swelling or dermatitis of the lids. Three cases had low grade iritis, and seven of them had catarrhal ulcers. Only five patients were seen at the time of the superficial keratitis which is believed by Drs. Allen and O'Brien to occur at some time in all of them. Four of the patients had dental extractions during the course of the disease, which for some reason seemingly had a beneficial effect on the disease. All of these cases were treated with vaccines and sulfathiazole. The majority of them responded well. Eight were stubborn and required longer treatment. One patient had frequent recurrences, each of which was quickly controlled by a single injection of toxoid, which kept her symptom-free for a few months at a time. One patient who had many glands of Henle, many of which were calcified, had only a moderate improvement after several months' treatment.

Conclusion

Staphylococcic conjunctivitis is a stubborn variety of conjunctivitis ranging from the severe acute forms to almost unrecognizable mild types, having a tendency to recurrences and chronicity.

The diagnosis should be suspected from the history and clinical findings, although cultures are necessary for confirmation.

It is probably the most frequent cause of catarrhal ulcers.

The stubborn varieties resist the usual treatment of conjunctivitis. Sulfathiazole and the staphylococcic vaccines and toxoids are valuable aids in the treatment of these cases.

References

1. Allen, J. H.: Amer. Jour. Ophth., November, 1939.
2. Allen, J. H., and O'Brien, C. S.: Amer. Jour. Ophth., June, 1938.
3. Duke-Elder: Textbook of Ophthalmology. Volume II.
4. Julianelle, L. A., Boots, R. H., and Harrison, G. H.: Amer. Jour. Ophth., 25:431, 1942.
5. O'Brien, C. S.: Wisconsin Med. Jour., May, 1938.
6. Scobee, R. G.: Amer. Jour. Ophth., 25:184, 1942.
7. Thygeson, P.: Amer. Jour. Ophth., August, 1938.

VISUAL MALINGERING

A. G. ATHENS, M.D.

Duluth, Minnesota

VISUAL malingering may be briefly defined as the assumption, by an individual, of a false visual status and the attempt to convince others of this status for purposes of gain.

The malingerer may simulate loss of vision where there is none or he may magnify an existing visual impairment. Occasionally one may find it advantageous to simulate better vision than he actually has. Such an individual is usually concerned with holding his position, in acquiring a new position or in gaining entrance to the armed forces, when knowledge of his actual visual acuity would thwart him. With such individuals one may generally sympathize.

As to the frequency of malingering there is much disagreement. Neuropsychiatrists are inclined to assume the existence of an organic basis for most claims of injury. There are even those who contend that there is always an organic or psychopathological basis for simulation. We may appreciate the difficulty in detecting a malingerer who, for example, complains of pain in his back. Fortunately the occulist is in a position to prove malingering beyond any doubt and one who sees many industrial eye injuries is soon convinced that visual malingering is not rare.

Presented in Symposium on Eye, Ear, Nose and Throat Diseases at the annual meeting of the Minnesota Medical Association at Duluth, Minnesota, July 1, 1942.

The fact that most industrial employes are insured against accident probably contributes to the frequency with which false claims are made. Many an individual who would not consider taking action against his employer would not hesitate to sue for excessive damages, even on false claims of injury, when he realizes that an insurance company must pay the claim.

A further factor contributing to malingering is undoubtedly the readiness of a certain few lawyers to accept cases and prosecute claims for damage based on the flimsiest of evidence. It is unfortunate that an occasional member of our own profession will, perhaps unwittingly, play into the hands and serve the purposes of such lawyers and their clients.

It is not dishonorable and is perfectly ethical for a physician to examine a client and even to appear in court for any properly qualified attorney, however notorious he may be, provided the physician is convinced of the honesty of the claims supported. However, I believe the physician should establish certain principles for his guidance. He should see that both the attorney and his client understand that his examination is made for the sole purpose of obtaining the facts and that his reports or any court testimony will be based on such facts. In other words, that he is not entering a partnership with an attorney for the purpose of winning a case. It is apparently sometimes difficult for an attorney to grasp this mental attitude on the part of a physician. Furthermore, I believe that no physician should obligate himself to examine a client and testify on his behalf on a contingent fee basis, for in so doing he compromises his report or testimony from the start. Such requests are not liable to come from highly reputable attorneys.

A physician who accepts medico-legal cases is generally asked to make a report, with his opinion as to the amount of disability and its relationship to an accident, to an attorney, either one who is the agent of an insurance company or of the individual who is making claim for compensation. He furthermore is liable to be asked to go into court by the attorney who requests the examination. If he is required to appear in court it will mean sacrifice of valuable time from his practice and often at the most inconvenient times. He should therefore charge a fee sufficient to properly compensate him for his time and work. He can then ungrudgingly devote adequate time and effort to the case.

One should never half-heartedly enter such work. He should be able to make positive statements of facts as he finds them. His reports should be concise, but complete and in simple terms. He should never be induced to go into court half prepared in a case. There are few scenes more pathetic than an honest, capable physician being made ridiculous on the witness stand by a smart lawyer, simply because he has not properly prepared his material. Such a physician not only humiliates himself but he is often of little or no value as a witness or may even do harm to a worthy litigant. His poor showing also reflects on the entire medical profession.

One must distinguish between the malingerer and the hysteric. This is not always easy but can usually be done by the attitude of the individual. The difference is in the state of mind. It has been said that the hysteric suffers from a psychic abnormality, while the malingerer suffers from a moral abnormality. The hysteric believes that he can't see but desires good vision and is anxious to coöperate with the examiner. The malingerer knows that he can see but tries to mislead and deceive the examiner. He is often sulky, uncoöperative and, at times, even hostile toward the doctor.

It has rightly been said that the physician is an enemy of the malingerer. He stands between the malingerer and his selfish ends. The physician should not, however, let any hastily acquired opinion interfere with a fair and impartial examination. But once he is convinced of malingering there is nothing gained by coddling or trying to keep the good will of a faker.

Presented with an individual claiming visual loss, one should first take a careful and detailed history of the alleged accident or injury. This should give an approximate picture of the eyes prior to the accident. Exactly what happened at the time of the accident? Was he rendered unconscious by a blow or a fall? Were there cuts or bruises on or about the eyes? Was visual loss immediate or was it noted after weeks or months had elapsed? If, for example, he volunteers that he was formerly considered a good marksman, using his injured eye, but since the accident has had poor luck at shooting, some substance is given to his claim. Whereas if he merely insists

that his eyes were perfect prior to an accident, which may have consisted of injury to some remote part, that he did not request or receive immediate treatment to his eyes, but that some weeks later he noted poor vision, one is far from convinced.

A complete detailed examination of the eyes should be made. This should include refraction, extraocular muscle balance, visual fields, and x-ray if penetration of the globe is at all likely. Measures for determining the state of general health, such as blood pressure reading and urinalysis should be taken if indicated. Visual tests should be left until the last. The size and motility of the pupils should be observed. An eye that reacts to light stimulus can hardly be totally blind. Dilated pupils that fail to react to light or in convergence may be the result of a mydriatic. The individual should be kept under observation for a week or ten days to see if a mydriatic has been used. If only one eye shows a fixed pupil, stimulate the retina with a small beam of light and watch the pupil of the other eye. The presence of the consensual reflex is proof that the stimulated eye is not blind. Mydriasis with a fixed pupil is said to occur rarely in hysteria. A blind eye, if screened, may deviate outward as the good eye fixes.

If a total or even a high degree of blindness is claimed in one eye place a 10 to 20 degree prism base out before the injured eye and ask the individual to fix a small light at the reading distance. If the eye turns in to take up fixation, malingering is proven (von Welz). A blind eye does not fix. Binocular single vision must be present in this test.

Bruner suggests the trick of holding up the subject's hand with all but two fingers flexed and, with his good eye closed, asking him to state the number of fingers extended. The truly blind will invariably answer correctly, while the malingerer will frequently answer falsely.

One who assumes better vision than he actually has is liable to memorize the usual charts and so be able to deceive the examiner. A homemade chart with an entirely different arrangement of the letters or the broken G or E letters may be used to obviate this possibility.

Those claiming partial blindness in one eye constitute the great majority who seek compensation for visual loss. For detecting these, numerous tests have been devised. These consist largely of colored letters viewed through colored glass or the use of spheres, cylinders and prisms manipulated in ways to confuse the subject and induce him to read the test letters with his injured eye in the belief that he is reading them with his uninjured eye. These will be discussed in groups and no attempt will be made to describe in detail each individual one. Many are mere modifications of earlier tests. It is not necessary that the examiner be acquainted with all or even a great number of the various tests. He should thoroughly familiarize himself with one or two tests in each group, involving different principles, and be able to use and interpret these without any hesitation.

One trick commonly used by experienced malingerers is that of closing the injured eye during a test in order to determine which eye he is using. Walker suggests that this be overcome by the examiner resting his thumb against the superior orbital rim and gently drawing upward on the upper lid, which renders closing impossible.

A commonly used test is to fog the vision in the good eye with a strong plus sphere while a very weak or plano lens is placed before the injured eye. If the subject reads thus he is doing so with his injured eye. Bruner suggests, in a young person with one normal eye, placing a +3.00 D sphere before his good eye and having him read the near card at 8 inches. Then he unobtrusively removes the card to 12 inches. If reading is still possible, it is with the injured eye, as the card is now beyond the focal point of this lens.

Many tests involve the use of cylinders in the trial frame. Jackson's crossed cylinders test is probably the best known of these. He places a +1.00 D cylinder and a —1.00 D cylinder in the trial frame, with their axes coinciding, before the good eye. A plano lens is then placed before the injured eye. The subject is then told to read the chart and while he reads, one cylinder is turned until the axes are perpendicular. In this position the resulting crossed cylinder is slowly rotated. If he continues reading, he must be doing so with his injured eye, as the vision in his good eye is blurred by the crossed cylinder. There are various modifications of this test. Since the introduction of polaroid glass, Gradle has devised a test making use of the fact that when two discs of this glass are placed so that the direction of their polarization crosses at right angles, very

little light is admitted. The discs are rotated before the good eye much as are the cylinders in Jackson's test.

Numerous tests make use of prisms. One of the best of these was introduced by Duane. He asked the subject to read aloud small Jaeger type and while he was so doing a 6 degree prism base up or down was placed before his injured eye. If he could see the print with the injured eye the resulting diplopia rendered further reading impossible. A better test, which I have often used in a modified form, but only recently learned, was described by Dr. Todd; it makes use of a double prism. Two prisms of about 5 degrees are placed bases together in a disc which fits into a trial frame. This disc is placed before the good eye with base line of the prisms at axis 180 so that this line bisects the pupil. The smallest line on the Snellen chart which the subject has been able to read with the good eye, or the line which you judge he should read with the injured eye, is now illuminated. He is then told, "Now this special glass multiplies this line. Instead of one line, you see three lines each above the other." When he admits this, he is again told, "Now with your good eye read the middle line." If he does he is caught. The prisms produce two lines with the good eye, one displaced above and one below the normal level. The third line between these, at the normal level, is seen by the injured eye. This test has the advantage of determining the visual acuity as well as detecting simulation.

The principle of the bar test is employed in various ways. In its simplest form the subject is asked to read Jaeger type and while reading, a pencil or rule is held vertically midway between his eyes and the page. If he continues reading, he is doing so with both eyes, as the pencil obscures a portion of the print from either eye.

Snellen's red glass test is based on the principle that colored light rays can pass through glass of the same color, but not through glass of a complimentary color. Letters in red and green glass, illuminated from behind, are viewed through discs of red and green glass placed before the two eyes. If he reads both colored letters he is reading with the two eyes as only the letters corresponding in color to the disc before the good eye can be seen with that eye. Care should be taken to see that the glass in the discs is exactly the same shade of color as that in the letters. Letters painted on cards are not as satisfactory because of the difficulty in matching the colors in the glass.

A number of tests have been described involving use of mirrors which reflect images of letters placed over the patient's head, in such a way that they can be seen only with one eye at a time. Most of these require special equipment.

Use of the stereoscope and the Worth amblyoscope have been suggested by a number of men. Dr. Todd was one of the first to see the possibilities of the latter instrument in testing for malingering. Gifford has had test letters and numbers printed on semi-transparent cards with the visual angles determined for the length of the amblyoscope tubes. These cards are inserted in the slots at the ends of the tubes and the tubes set at such an angle that the images are crossed, the image of the letters in the right tube being projected to the left side and vice versa. The letters are illuminated by a light held at the ends of the tubes. The subject is then told to look into the instrument and first read the letters he sees with his good eye. If he is malingering, he naturally reads the letters which appear to be on the side of the uninjured eye. These are of course seen with the supposedly blind eye. This is the most reliable test which I have used. One cagey subject, who by blinking his supposedly bad eye, caught on to the maneuver, was trapped a moment later by my changing the type and while so doing shifting the tubes so that the images were no longer crossed. He then read the type appearing on the side opposite his good eye.

Occasionally one encounters an individual who claims partial loss of vision in both eyes. In such a case, by varying the distance of the chart from the eye, thus changing the visual angle, one may be able to detect simulation. A subject who is very observing may detect this deception, however. For such cases the author has had an ordinary Snellen chart reduced by a series of photographs in such a way that the visual angle of a line of letters on each reduction is the same as that of the next line above in the foregoing chart. For example, the top line representing 20/200 vision on the original chart represents 20/150 on the second, 20/70 on the third and 20/50 on the fourth chart. If the patient contends that he sees only the top line, representing 20/200, on the original chart, the examiner takes the patient into another room and pretends to "treat" the eyes to see if the vision can be improved. While so

engaged, his assistant replaces the original chart with the first one in the reduced series. The patient then is brought back to see if he can do better. If he still reads the top line he is caught, as this now represents a smaller visual angle. The procedure is repeated as long as he will admit seeing the top line. These charts should be hung on a background of plain white, as any contrast with the white card may reveal the decrease in size. It is contemplated to have these reduced letters printed on cards all the same size with the lines spaced as in the original.

To summarize, a plea is made for careful and detailed preparation in medico-legal cases. It is felt that it is one of the duties of the ophthalmologist to do his utmost to expose the malingerer. In so doing, he will render a public service as well as enhance his own reputation.

A brief outline of the various types of malingering tests is given and special charts for the detection of simulated binocular vision loss are presented.

SPONTANEOUS PARALYSIS OF THE SEVENTH AND EIGHTH NERVES, WITH RECOVERY

ORIEN B. PATCH, M.D.
Duluth, Minnesota

MEDICAL literature of nearly half a century contains references to "rheumatic paralysis of the acoustic nerve," and several reports of that era note "combinations of rheumatic affections of the auditory nerve with facial paralysis."

I wish to report a case which, if it had been reported at the time the other few had been, would have been classed as a "rheumatic paralysis" rather than a neuritis, of the facial and auditory nerves.

Case Report

On the morning of November 12, 1940, Mrs. F. A. S. walked a mile and a half against a thirty-eight-mile-an-hour wind in a temperature of 14° F. Arriving home, she complained of tingling and burning of the right side of her face together with marked postauricular pain on the same side. The skin was not discolored. This pain left in forty-eight hours, only hyperesthesia of the area remaining.

Five days later she suddenly became dizzy, nauseated and unable to sit up without vomiting. Her physician, finding no signs of vestibular or intracranial disease, treated her as a gastrointestinal dysfunction.

Two days later, on November 21, 1940, she awoke with a complete facial paralysis on the offending side (right). Her vertigo and nausea had practically ceased. She felt as though her right auricle was "limp" and her external auditory meatus "numb."

Her physician found no deafness nor nystagmus; the urine was normal; the blood pressure 120/80. Postauricular hyperesthesia was still present on the right but no hyperacusis was noted. During the next two weeks her facial paralysis cleared slowly beginning with ability to close her right eye better. She consulted her physician by telephone, during this time, reporting her progress day by day.

On the morning of December 9, 1940, she called her physician again and discovered to her consternation that she was totally deaf in her right ear. She habitually used her right ear during conversation, although she was right handed. I saw her the following morning in consultation.

The patient was a forty-nine-year-old white female, well developed and well nourished, not acutely ill. Her family history and past history were irrelevant except for occasional variations in blood pressure. Her record at the Clinic over thirteen years showed only an occasional gastrointestinal upset. Her laboratory findings on this examination showed a negative Kline, hemoglobin 82 per cent, erythrocytes 4.2 million, leukocytes 7,700, and the urine negative.

The only positive neurological findings were confined to the right side of the face and the right ear.

The face showed a slight weakness of the corner of the mouth on the right, and the right ala did not dilate well. There were no bite marks on the cheek. Taste was unimpaired.

The nose, throat and sinuses were normal.

The rest of the examination dealt with the ears. Both membrana tympani were normal in appearance, all landmarks being clearly visible. The eustachian orifices were patent.

Forks (C_1, C_2, C_3) were used to determine her reaction to the Schwabach, Rinné, and Weber tests. Air and bone conduction were lost completely on the involved side. Gellé test gave no response. Audiograms taken on the Maico Audiometer with and without masking were identical. The left ear showed essentially normal hearing up to 11,584 d.v. where there was a drop of 25 decibels, considered physiologic for her age.

Vestibular tests, using the Kobrak method, showed

From the department of Ophthalmology and Otolaryngology, The Duluth Clinic, Duluth, Minnesota. Presented at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 1, 1942.

a markedly hypoactive labyrinth on the right; nystagmus coming on 45 seconds after 5 c.c. of water at 55° F. had been injected against the posterior superior quadrant of the drum. The nystagmus was rotary to the left and past pointing to the right was questionable. Inclining the head back 60° gave the same response except the nystagmus was horizontal. A trial frame with 20 spheres as lenses was used to detect the nystagmus, since it was so small and lasted only 20 seconds.

Caloric tests done on the left ear, same method, gave marked response with nystagmus coming on in 20 seconds and lasting 75 seconds with past pointing to the left with each hand about 6 inches, accompanied by a sensation of turning to the right and a marked tendency to fall to the left.

The impression at this time was that she had neuritis of the VII N. distal to the geniculate ganglion with secondary involvement of both branches of the VIII N.

She was given thiamine chloride 0/009 gm. orally, four times a day. No other therapy was used.

She returned three weeks later saying she had "about 7/8" of her hearing back in the right ear. For the preceding ten days she noticed a "strange metallic rustle in the deaf ear." Further, she stated spontaneously, "As soon as I noticed that rustle in my ear, I found I had a little of my hearing back; since I could make out fairly well on the telephone with it." Examination this time showed no evidence of facial paralysis. Hearing tests showed decreased bone conduction on the right, Rinné negative, Weber to the left. Tragus test was not done.

An audiogram showed an average loss of 25 decibels up to 2,048 div. with a sharp drop of 45 decibels af- 4096 d.v. and 60 decibels loss at 11,584 d.v. The left ear was masked. Hearing in the left ear remained essentially the same. She was told to reduce the thiamine chloride to 0/009 once a day.

She returned again three months later, by request, and her response to forks was equal on both sides. The audiogram showed the right ear now to be slightly better than the left, but due to the fact that she came in at an unusual hour, there was about ten decibels of noise in the room, which may account for the decrease in acuity. All other tests were done with absolute silence in the room.

Exactly one year later (March 12, 1942) she returned and her hearing was rechecked. The only significant features then were: (1) increased dip at 4096; (2) slight increase in loss of high tones. She had been in excellent health during the past twelve months. Both of these points may be explained by the normal physiological loss of hearing due to advancing age, as shown by the slide.

Comment

Politzer in his text "Diseases of the Ear" pointed out that this condition, ". . . if judged from its clinical cause, is most likely brought about by a neuritis." Bing in 1880 reported a case in which the auditory apparatus was affected alone. Hong and Morpurgo, Moos, Rosenbach and V. Frankl-Hochwart reported combinations of "rheumatic affections of the auditory nerve with facial paralysis between 1880 and 1897.

Gradenigs, Barnick and Lannois in 1890 demonstrated that the paralysis of the sound-perceiving apparatus may be considered as a neuritis of the acoustic nerve, and took their cases from patients suffering from influenza.

Of interest in this case presented, Mrs. F. A. S., is the fact that it follows so closely the keenly observed clinical course described by many of the early investigators. One point will demonstrate this, and I quote again from Politzer: "The course of this disease is such that the vestibular symptoms disappear first, while the disturbance of hearing returns to its normal condition only at a later stage. In a number of cases, a permanent disturbance of hearing remains."

Conclusion

A case has been presented in which paralysis of the VII and VIII nerves was brought about, in the order of (a) vestibular portion of VIII first, (b) VII second and (c) cochlear division of VIII lastly. There was a complete recovery. The geniculate ganglion was spared.

MENINGITIS INCREASES ALMOST 20 PER CENT IN WEEK

Cases of meningitis throughout the nation increased almost 20 per cent during the week ending January 23, latest for which figures are available. Reports from state health officers to the U. S. Public Health Service show 354 cases for the past week as compared with 298 for the week of January 16. Most of the cases are on the East and West coasts.

Total number of cases for the year to date, that is, to January 23, is 941, which is probably the largest number for that short a period since the U. S. Public Health Service has been keeping weekly records of this disease.

Influenza cases totalled 4,387 for the week of January 23, about the same as for the previous week. Measles increased slightly.

There were 23 cases of smallpox, five in Ohio and four in Indiana. No other state reported more than two.—*Science News Letter*, February 6, 1943.

LOSS OF CILIA IN THE RESPIRATORY TRACT AND ITS RELATION TO DEATH FROM RESPIRATORY DISEASE

Preliminary Report

A. C. HILDING, M.D.
Duluth, Minnesota

SOMETIMES rather obvious pathological changes escape attention for a long time, probably because their relation to known facts is not appreciated. Perhaps it is because they are not needed to explain the current theories concerning the conditions in question. There are very striking pathological changes in the respiratory epithelium of the bronchial tree in asthma and other respiratory diseases which have either escaped attention entirely or have been insufficiently emphasized. The object of this study is to point out some of these changes, especially those involving the loss of cilia.

The material thus far studied consists of the tissue sections from thirty-one fatal cases of asthma, twelve fatal cases of influenza, and six fatal cases of bronchopneumonia, found in the files of the Department of Pathology at the University of Minnesota.

Asthma

When death occurs in status asthmaticus the bronchial tree fills up with a heavy, tenacious, mucinous secretion. Death is due to asphyxia. The usual explanation given is that the secretion is too heavy for the respiratory tract to remove.

Normally, the tract is kept open and free of accumulated secretion and debris by means of ciliary action. There is a continuous thin blanket of tenacious mucus normally covering all of the epithelial surfaces. This blanket is in constant motion, being propelled by ciliary action, and is removed and renewed two or three times each hour. I once made some tests designed to determine what type of secretion was best handled by the ciliary system.[2] Three types of material were tested, namely, thin aqueous solutions, thick pus-like material, and gummy tenacious material prepared from commercial mucin. It was found that a very heavy, tenacious mucin, so gummy that it could be picked up with thumb forceps, was moved up vertical surfaces by ciliary action with the greatest dispatch and the most cleanly.

The results of these tests do not agree with the theory that secretion accumulates in the respiratory tract in asthma because it is too heavy for the epithelium to remove. There is another explanation which was found in this pathological material. A metamorphosis of the respiratory epithelium had taken place in a large proportion of the cases. The usual ciliated columnar epithelium had been replaced by epithelium com-

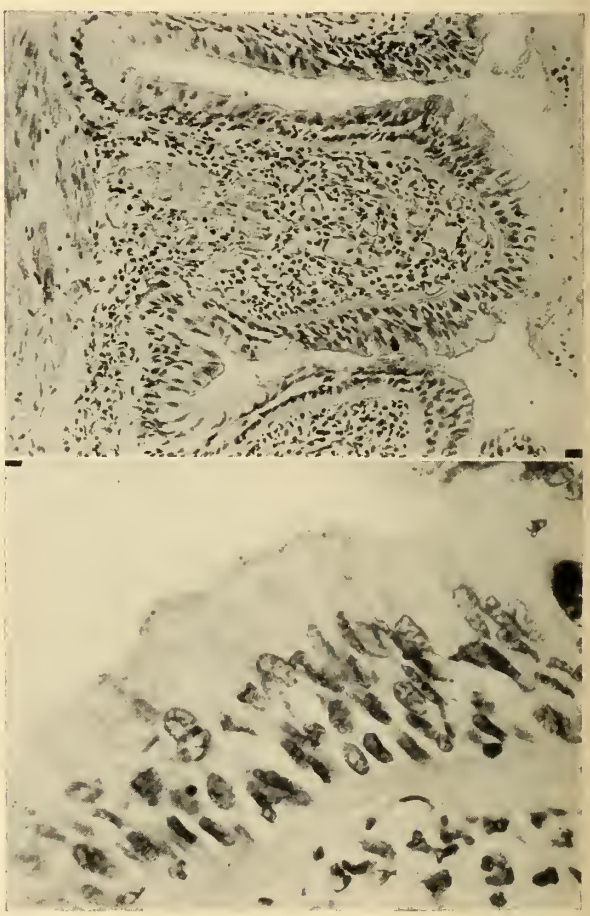


Fig. 1. Low power and high power views of the bronchiolar epithelium from a fatal case of asthma of six years' duration. Practically all of the cells are non-ciliated secreting cells instead of the ciliated cells normally found in this epithelium.

From Department of Pathology, University of Minnesota. Presented before the Milwaukee Oto-Ophthalmic Society March 11, 1942, the Society of Experimental Biology and Medicine March 18, 1942, and the Minnesota State Medical Association July 1, 1942.

posed largely, or entirely, of goblet cells or secreting cells (Fig. 1). This change is mentioned by Bell in his textbook,[1] but I have found no other reference to it.

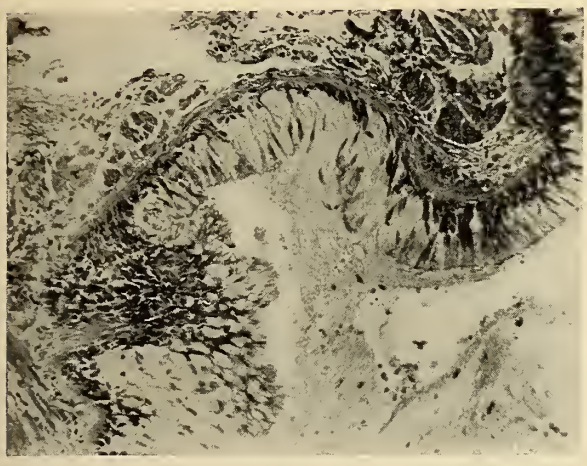


Fig. 2. Bronchiolar epithelium from a fifty-year-old patient with a history of long standing asthma. Note how the mucus produced by the epithelium remains attached deep in the epithelium and still is fused with the mass in the lumen.



Fig. 3. Low power and high power views of bronchial epithelium in a fatal case of asthma of twenty years' duration. The entire epithelium is melting into the secretion accumulated in the lumen. There are no ciliated cells whatever in this area.

A study of the lung sections in the thirty-one cases soon showed that clinical asthma is not a disease entity. A variety of pathological pictures were found. Thirteen showed the metamorphosis mentioned with little or no inflammatory reaction. Six had pneumonia with purulent bronchitis. Three showed marked constriction of the bronchioles with no other marked change. (In one of these the final pathological diagnosis read, "Cause of death not determined.") Four exhibited extensive sloughing of the epithelium as the chief change. In two the epithelium appeared to be essentially normal, and of the remaining two one had pneumonia with little change in the bronchial epithelium, and the other was a case of acute tracheo-bronchitis.

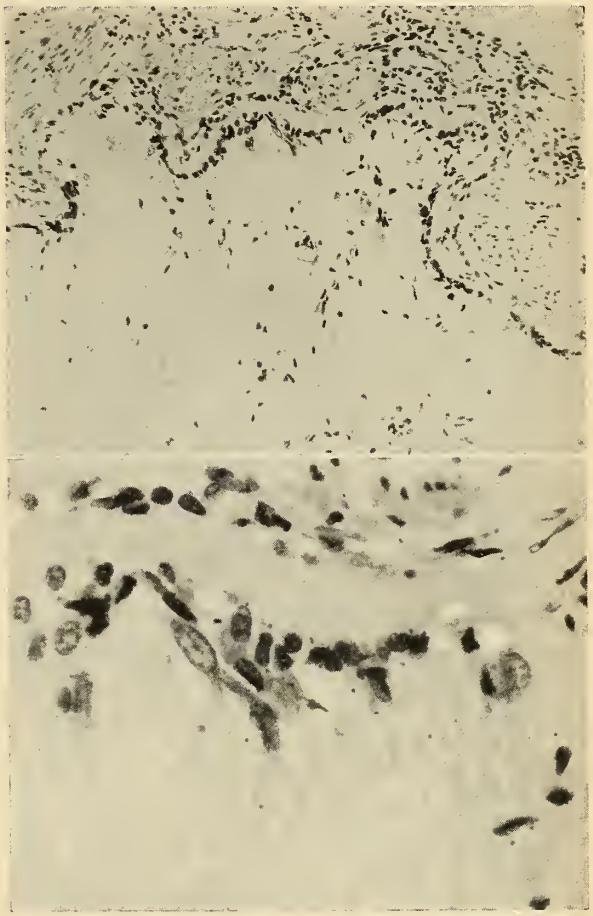


Fig. 4. From the same case as Figure 3. Photomicrograph of another area of bronchial epithelium. Here some ciliated cells have been preserved. The mucus in the lumen appears to be free over the cilia but is attached to the epithelium in the secreting cells. This area suggests that the individual ciliated cells may actually become secreting cells. The different appearances of the individual cells might be different stages in the metamorphosis.

The metamorphosis of epithelium found in the largest group (the 13) seemed to occur in those cases which were not infectious or complicated by infection. A very great increase in the number of goblet cells was found. It ranged from 30 per cent to as high as 100 per cent in some areas (Fig. 1). These secreting cells were all devoid of cilia and seemed to be actively engaged in secreting the material with which the lumina of the bronchioles were more or less completely filled. In many areas the secretion produced by

the cells did not leave the cells completely, but nevertheless fused with the accumulated mass lying in the lumen (Fig. 2). Thus the mass was anchored deep within the epithelium. In some areas the entire epithelium appeared to melt into the accumulated secretion, even the nuclei passing out into the lumen (Fig. 3). Here and there areas were found containing alternating patches of ciliated cells and secreting cells. The accumulated secretion in these areas appeared to be free of the epithelium over the cilia, but attached where there were no cilia (Fig. 4).

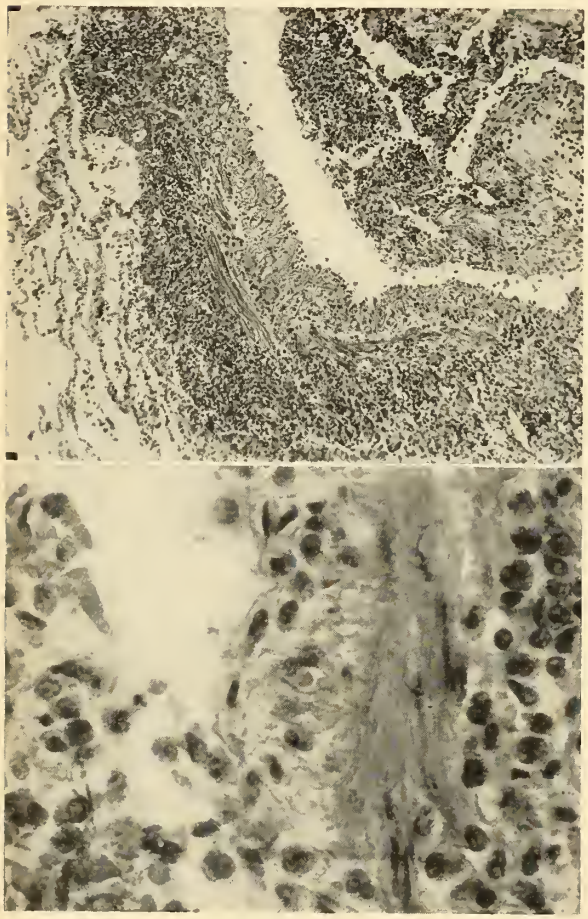


Fig. 5. Low power and high power photomicrographs of the bronchiolar epithelium from a fatal case of acute tracheo-bronchitis. There is an extensive severe purulent inflammation with radical changes in the epithelium. No ciliated cells could be found.

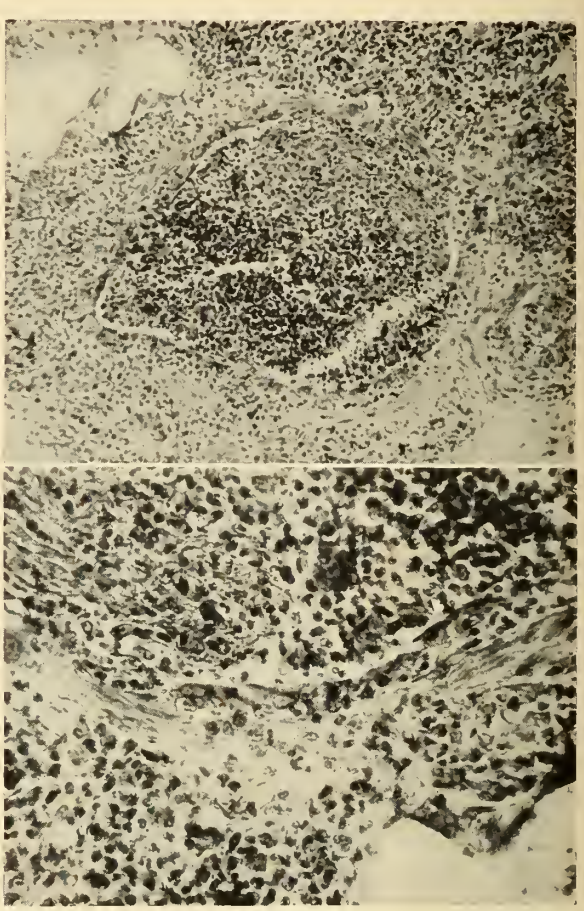


Fig. 6. Low power and high power photomicrographs of a bronchiole from a fatal case of influenza from the pandemic of 1918. The epithelium is entirely destroyed, and the lumen is filled with a purulent secretion.

Tracheo-Bronchitis

One of the cases listed among the asthmatics proved to be a case of acute tracheo-bronchitis. He gave no history of having had asthma previous to his final illness. His final illness lasted only three days and began like an attack of the common cold. His chest was clear until the final day when he became dyspneic and asthmatic sounds were heard in his chest. He was hospitalized and given oxygen and adrenalin, pantopon and atropin, but died with extreme dyspnea. In the necropsy report the heart was described as normal. "The lungs were heavy, crepitated throughout and exuded abundant fluid on section. There were numerous thick tenacious plugs expressed from the bronchioles of both lungs."

The microscopic sections reveal almost complete destruction of the bronchial epithelium (Fig. 5). The cells in many cases had been exfoliated down to the last layer of stellate cells. Not a single intact ciliated cell could be found. There was a beginning pneumonia, but the essential picture was that of an acute purulent

bronchitis with loss of respiratory ciliated epithelium and with all of the bronchioles filled with purulent exudate.

Influenza

The twelve cases of influenza were taken from the 1918 files. These patients were among the many that perished in the pandemic of 1918. The histories indicated that the patients died deaths which were currently described as "drowning in their own secretions."

There were only a few lung sections saved from each case, and most of these were taken near the periphery. Some bronchioles were found in each, however. The essential picture in these sections was that of an acute bronchitis with beginning pneumonia. The bronchioles were filled with exudate, and the epithelium was very badly damaged (Fig. 6). In two the epithelium was destroyed to the last cell as far as could be determined. In seven it was largely gone, and in two partially gone. In only one was the epithelium fairly intact, and in this one the surface cells were so generally exfoliated that only a few cilia could be found.

Discussion

In the asthmatic cases which were uncomplicated by infection, the essential cause of death seemed to be failure of the ciliary system. The thick, gummy secretion which causes the asphyxia is of the type of material which cilia handle best. The failure of the ciliary system is due to a progressive metamorphosis or replacement of the ciliated, columnar cells by secreting or goblet cells which are non-ciliated. Accumulation of quantities of this mucinous secretion in the bronchial tree is favored by three factors: (1) loss of cilia to move it; (2) increased production of mucus by the increased number of secreting cells; and (3) attachment of the mucinous mass to the cells which produce it.

Whether the change from ciliated to secreting cells is an actual metamorphosis of the individual cells from one type to another, or whether it is a replacement of one type of cell by another type, has not been determined, and is not essential for this discussion. (Figure 4 suggests that it may be a true metamorphosis.) Neither has the cause of this change been determined, but there is some experimental evidence to indicate that it is due to decreased volume of air flow. I have produced this change experimentally in the nose of the rabbit.[3]

Death in the single case of tracheo-bronchitis seemed to have been due to asphyxia from accumulated secretion. The loss of ciliary action here also was probably the immediate cause of death.

The clinical course and the pathologic picture in the bronchioles in the influenza cases is suggestive of the pathology of the common cold.[4] The ciliated surface cells in the nasal epithelium are largely sloughed away by the second day of a severe cold. The secretion is abundant and very liquid, but it does not accumulate. Instead it drains away harmlessly by gravity through the nostrils or choanæ or is blown out. After three or four days the ciliated cells which were lost have again been replaced, and the ciliary system is again functioning. If such an extensive loss of cilia takes place in the bronchial tree in the early stages of influenza, it is likely that the accumulation of abundant watery excretion in the air passages is due at least partly to this cause. That the cilia are lost is clear; at what stage the loss occurs is not known. If loss of cilia be the cause of the accumulation of the serous fluid which "drowns" the patient, then it may also be the cause of the extension of the infection into the alveoli and of the development of pneumonia. It is fair at this stage of the study to state that loss of ciliary function is at least an important factor in the development of influenzal and other pneumonias. The ciliated epithelium was badly damaged in the cases of bronchopneumonia examined. It is common knowledge that cilia are lost in many areas in cases of bronchiectasis. Probably loss of cilia is a factor also in development and distribution of bronchiectasis.

References

1. Bell, E. T.: Textbook of Pathology. Philadelphia: Lea and Febiger, 1938.
2. Hilding, A. C.: Physiology of drainage of nasal mucus. Am. Jour. Physiol., 100:665-670, (May) 1932.
3. Hilding, A. C.: Experimental surgery of the nose and sinuses. Arch. Otol., 16:9-18, (July) 1932.
4. Hilding, A. C.: The common cold, 12:133-150, (Aug.) 1930.

THE BENEFICIAL EFFECT OF UREA IN TOPICAL SULFONAMIDE THERAPY

I. Treatment of Infected Dermatoses. II. Effectiveness of Urea-Sulfonamide Combinations in Sulfonamide-Resistant Infections

ERNEST A. STRAKOSCH, M.D., M.S., and WILLIAM G. CLARK, Ph.D.
Minneapolis, Minnesota

DURING the past two years many reports have been made of the use of topically applied sulfonamides in the treatment of infected dermatoses, infected wounds, burns, ulcers, and so forth. A great number of workers in this field have used the same or different sulfonamides in various vehicles, reporting excellent results. The most successful results have been obtained in conditions in which the causative micro-organism was either a streptococcus or a staphylococcus, or in secondarily infected lesions. The subject is well reviewed in the new second edition of Spink's book on sulfonamides.[14]

Although the topical application of the sulfonamides proved to be definitely superior in the treatment of pyogenic skin conditions as compared with the older methods, it nevertheless often falls short of our expectations, and sometimes fails completely. This, among other reasons, has caused some workers to lose interest in the sulfonamides, turning to other possibilities such as the use of gramicidin, penicillin, and the like.

Our best results were obtained in very superficial pyogenic infections, such as impetigo contagiosa. In various chronic eczematoid lesions from which large numbers of streptococci or staphylococci were recovered, the effects of a 5 per cent sulfathiazole ointment were much less striking, as was also shown by Pillsbury et al.[11] Some of the failures observed in our clinics may be attributed to the improper selection of the ointment base. The value of such selection has been discussed in previous publications[16,17] In our work we have observed not only failure of the sulfonamides to benefit many cases, but an actual aggravation of the condition. It is our opinion that such observations will become more numerous, since there is hardly a skin lesion which has not been treated with these compounds in some form. Some of these aggravations are due to the use of the sodium salts of sulfathiazole and sulfadiazine, which will cause chemical burns even when used over a short period of time, due to the strong alkalinity of these salts (pH 9 to 10 in concentrations of 1 to 10 per cent).

In addition to the above objections, failures have also been observed even when the proper sulfonamides have been applied in the proper vehicles, or in powder form. These occurred in cases in which the skin lesions were either heavily crusted, or in which there was an abundance of necrotic tissue and pus. Since it is now well known that inhibitors of the sulfonamides, such as products of proteolysis in purulent exudates, are plentiful in infected wounds,[7] it would be very desirable to either: (a) find a method by which these inhibitors could be partially or completely removed or antagonized; (b) employ higher concentrations of completely dissolved sulfonamides which are non-caustic to open lesions; or (c) enhance the bacteriostatic action of the sulfonamides. Increased concentrations seemed not always to overcome the inhibitory effects of purulent lesions, as indicated by the results of some cases with 3 per cent sodium sulfathiazole and which did seem aggravated by this salt (see Table I). Higher concentrations could not be used because of caustic action. In this respect, it is admitted that higher concentrations of sodium sulfacetamide or of the calcium salts of sulfathiazole or sulfadiazine, which do not have such high alkalinities, might be effective. Another reason why failures have been seen in topical sulfonamide therapy, is possibly because the causative organisms were or became resistant to sulfonamides, the so-called "sulfonamide-fast" organisms.

Holder and MacKay[4] have recently reported that a powder consisting of urea 90 per cent, sulfanilamide 10 per cent, topically applied, markedly benefits contaminated and infected wounds. They point out that the strong urea mechanically removes sulfonamide inhibitors by its peptizing and hyperemic action. Strong urea increases the solubility of the sulfonamides,[5,13] and it also

From the Division of Dermatology and Syphilology, University of Minnesota, the Department of Dermatology and Syphilology, Minneapolis General Hospital, and the Department of Zoology, University of Minnesota. Supported by a grant from the General Research Fund of the University of Minnesota and by a grant from the Abbott Laboratories, North Chicago, Ill. Assistance was furnished by the personnel of Work Projects Administration, O.P. 165-1-71-124, Subproject No. 383.
Presented for publication, October 9, 1942.

cleans wounds by removal of necrotic tissue by its solvent action on such tissue. It is also bacteriolytic, deodorizes foul-smelling infections, and is very inexpensive. These qualities have been reviewed by Holder and MacKay in their several publications.[4]

We recently have been able to demonstrate that urea in low concentrations exerts a synergistic action with sulfonamides on Escherichia coli in a synthetic medium.[19] The same low concentration also neutralizes the sulfonamide inhibitory action of methionine and para-amino-benzoic acid, compounds which belong to the sulfonamide inhibitor group of compounds.[7] Since urea possesses the beneficial qualities pointed out above, it offers advantages over certain other substances, such as azochloramid, which has been shown by Neter[8] and others to neutralize sulfonamide inhibitor action, and enhance the bacteriostatic action of sulfonamides.

It would be highly important if an anti-sulfonamide-inhibitor or sulfonamide enhancing action could be clinically demonstrated for urea. Holder and MacKay's[4] cases indicate this possibility. We therefore attempted to compare, in suitable clinical cases, the local action of a sulfathiazole-urea mixture, with the action of sulfathiazole alone.

Experimental Studies

1. *Treatment of Infected Dermatoses.*—Twenty-eight cases of dermatoses due to staphylococci, streptococci, or both, were treated with a urea-sulfathiazole mixture. They were selected so that each case acted as its own control, presenting a bilateral involvement of the extremities or head. The comparison of the experimentally treated area with the control area was not always accurate, for it is difficult to find two equally involved areas. For better comparison of the action of the urea-sulfathiazole mixture as compared with sulfathiazole alone, the most involved area was always treated with the mixture. The mixture was applied in three ways. First it was applied in the form of an ointment consisting of sulfathiazole 5 per cent, urea 30 per cent, in a base consisting of fatty esters of diethanolamine mixed with petrolatum ("Hydrosorb," Abbott). The control ointment contained 5 per cent sulfathiazole alone. Secondly the mixture was applied in the form of wet packs of a solution consisting of two parts of water in which was suspended a powder mixture of urea 70 per cent, lactose 20 per cent, and sulfathiazole 10 per cent. The control wet packs contained saline saturated with sulfathiazole at 40°C. The solutions were shaken before use, as the sulfathiazole was present in excess amounts. Ten layers of gauze were used as packs, soaked with the solutions at least every hour. Sterile wax paper as the primary dressing prevents evaporation and reduces the amounts of solutions needed, as has been pointed out by Holder and MacKay.[4] Solubility determinations made by us and by others[5] have subsequently shown the concentration of the sulfathiazole in this mixture, saturated in water, to be of the order of 0.5 per cent; thus our powder mixture contained an unnecessary excess. These data for the solubilities of various sulfonamides in this mixture in various amounts of water, serum, and other solvents, will be published elsewhere. The lactose prevents crusting due to the tendency of urea to crystallize from a strong solution. It has also been used as a deodorant in the treatment of osteomyelitis and is claimed to make dressings less adherent, an observation which has been confirmed by us. It should be reiterated at this point that sulfathiazole is far more soluble in a strong urea solution than in water alone. Thirdly, the mixture was applied, as such, in powder form.

Table I shows the cases studied to date. The age, sex, involved areas, bacteriological findings, treatment, and healing time are listed. The healing time implies the time to complete epithelization of the lesions. Quantitative studies on suppression of the bacteriological populations cannot be made in clinical infections treated with bacteriostatic agents. Quantitative bacteriological studies in experimental animals with standardly infected wounds are being made at the present time and soon will be reported by us. The healing time and the appearance of the lesions as seen clinically in our hospital cases were therefore taken as criteria of the effects. Photographs illustrate the typical responses (Table I).

2. *Urea-sulfonamide Treatment of Pyodermic Lesions due to Sulfonamide-resistant Staphylococci.*—Vivino and Spink,[21] Tredway and Sadusk,[18] Helmholz,[3] Schmidt et al.,[12] Stokinger et al.,[15] and many others have shown that sulfonamide resistance can be acquired by staphylococci, pneumococci, streptococci, E. coli, and gonococci *in vitro,* and *in vivo* in patients treated with sulfonamides.

TABLE I. COMPARISON OF THE EFFECT OF TOPICALLY APPLIED SULFATHIAZOLE, ALONE AND IN COMBINATION WITH UREA ON INFECTED DERMATOSES

KEY:
L—left
R—right
SAT—sulfathiazole (Lederle)
NaSAT—sodium sulfathiazole (ibid)
U—urea (Du Pont cryst.)
L—lactose (USP powder)
H—"Hydrosorb" ointment-base (Abbott)
CP—coagulase positive
Hem.—hemolytic
Strep—Streptococci
Staph.—Staphylococci

Case No.	Sex	Age	Area Involved	Diagnosis	Treatment	Healing Time Comments
1.	F	23	Both hands	Eczematoid dermatitis Hem. Strep.	L hand 5% SAT, 30% U in H	5 days
					R hand 5% SAT in H	8 days
2.	F	29	Both hands	Eczematoid dermatitis Staph., CP. Hem. Strep.	R hand 5% SAT, 30% U in H	4 days
					L hand 5% SAT in H	7 days
3.	M	25	Both legs	Pyodermia Staph. CP.	L leg 5% SAT, 30% U in H	5.5 days
					R leg 5% SAT, in H	8 days
4.	M	53	Face and neck	Eczematoid dermatitis Hem. Strep.	R half 5% SAT, 30% U in H	5 days
					L half 5% SAT in H	9 days
5.	M	51	Face and neck	Eczematoid dermatitis Hem. Strep.	R half 5% SAT, 30% U in H	6 days
					L half 5% SAT in H	8 days
6.	M	19	Both hands	Eczematoid dermatitis Hem. Strep. Staph. CP.	L hand 10% SAT, 20% L, 70% U, 1 part in 2 parts H_2O. Wet packs	3 days
					R hand SAT sat'd in saline as wet packs	Not much improvement after 5 days
7.	M	29	Both hands	Pyodermia Hem. Strep. Staph. CP.	L hand 10% SAT, 20% L, 70% U, 1 part in 2 parts H_2O. Wet packs	3.5 days
					R hand SAT sat'd in saline as wet packs	8 days
8.	F	45	Both legs	Ecthyma Staph. aureus CP.	R leg 5% SAT, 30% U in H	6 days
					L leg 5% SAT in H	9 days
9.	F	35	Both hands and forearms	Eczematoid dermatitis Staph. aureus CP.	R arm 5% SAT, 30% U in H	Improved after 3 days Rx discontinued
					L arm 5% SAT in H	No result after 5 days
10.	F	12	Both hands	Pyodermia Staph. aureus CP.	L hand 5% SAT, 30% U in H	4 days
					R hand 5% SAT in H	6 days
11.	F	14	Both hands	Pyodermia Staph. aureus CP.	L hand 5% SAT, 30% U in H	5 days
					R hand 5% SAT in H	7 days
12.	M	45	Face	Eczematoid dermatitis Staph. aureus CP.	L side 3% aq. NaSAT, wet packs	Caustic action
					R side 10% SAT, 20% L, 70% U, 1 part in 2 parts H_2O. Wet packs	Rx discontinued
13.	F	23	Both hands	Pyodermia Staph. aureus CP. Hem. Strep.	R hand 10% SAT, 20% L, 70% U, 1 part in 2 parts H_2O Wet packs	4.5 days
					L hand 3% aq. NaSAT wet packs	7 days
14.	F	24	Both hands and forearms	Eczematoid dermatitis Staph. aureus CP.	R arm 10% SAT, 20% L, 70% U, 1 part in 2 parts H_2O Wet packs	No improvement in 7 days
					L arm 3% aq. NaSAT wet packs	No improvement in 7 days

TABLE I (CONTINUED)

Case No.	Sex	Age	Area Involved	Diagnosis	Treatment	Healing Time Comments
15.	F	45	Both legs	Ecthyma Staph. aureus CP.	R leg 10% SAT, 20% L, 70% U, 1 part in 2 parts H_2O Wet packs	No improvement in 6 days
					L leg 3% aq. NaSAT, wet packs	No improvement in 6 days
16.	F	5	Face	Impetigo Staph. aureus CP.	R side 5% SAT, 30% U in H	4 days
					L side 5% SAT in H	6 days
17.	F	11	Face	Impetigo Staph. aureus	R side 5% SAT, 30% U in H	4.5 days
					L side 5% SAT in H	6.5 days
18.	F	15	Face	Impetigo Staph. aureus CP.	R side 5% SAT, 30% U in H	5 days
					L side 5% SAT in H	5 days
19.	M	14	Face, both hands	Impetigo Staph. aureus CP.	L side 5% SAT, 30% U in H	5.5 days
					R side 5% SAT in H	6 days
20.	F	12	Face	Impetigo Staph. aureus CP.	R side 5% SAT, 30% U in H	5 days
					L side 5% SAT in H	5 days
21.	F	24	Both hands	Eczematoid dermatitis Hem. Strep.	R hand 10% SAT, 20% L, 70% U powder	7 days
					L hand SAT powder	10 days
22.	F	55	Both legs	Ecthyma Staph. aureus CP.	R leg 5% SAT, 30% U in H	11 days
					L leg 5% SAT in H	16 days
23.	M	37	Both hands and forearms	Eczematoid dermatitis Staph. aureus CP.	R arm 10% SAT, 20% L, 70% U, 1 part in 2 parts H_2O Wet packs	No improvement in 7 days
					L arm 3% aq. NaSAT	No improvement in 7 days
24.	M	56	Both hands	Pyodermia Hem. Strep. Staph. aureus CP.	R hand 5% SAT, 30% U in H	6 days
					L hand 5% SAT in H	10 days
25.	F	14	Face and both hands	Impetigo Staph. aureus CP.	R side 5% SAT, 30% U in H	5 days
					L side 5% SAT in H	7 days
26.	M	16	Face and both hands	Impetigo Staph. aureus CP.	R side 5% SAT, 30% U in H	3 days
					L side 5% SAT in H	4.5 days
27.	F	15	Both hands	Pyodermia Hem. strep. Staph. aureus CP.	R hand 10% SAT, 20% L, 70% U, 1 part in 2 parts H_2O Wet packs	3.5 days (See Figs. 1-4)
					L hand 3% aq. NaSAT wet packs	5.5 days
28.	F	29	Both hands	Eczematoid dermatitis Staph. aureus CP.	L hand 5% SAT, 30% U in H	5 days
					R hand 5% SAT in H	Still active, and lesions spreading after 8 days

Neter[8,9] has recently reported that azochloramid can remove this resistance *in vitro,* as well as in two clinical cases, one of which was a wound infected with a sulfonamide-fast staphylococcus, and an empyema caused by a sulfonamide-fast streptococcus.

In a paper to be presented elsewhere[20] we have shown that sulfonamide resistance of various

strains of staphylococci recovered from sulfonamide treated patients, could be antagonized *in vitro* by concentrations of urea which did not effect the organisms in the absence of sulfonamides.

in vitro tests, which will be reported in detail elsewhere. We have been able to overcome this sulfonamide-fastness by topical treatment with urea-sulfonamide combinations where sulfonamides alone proved ineffective.

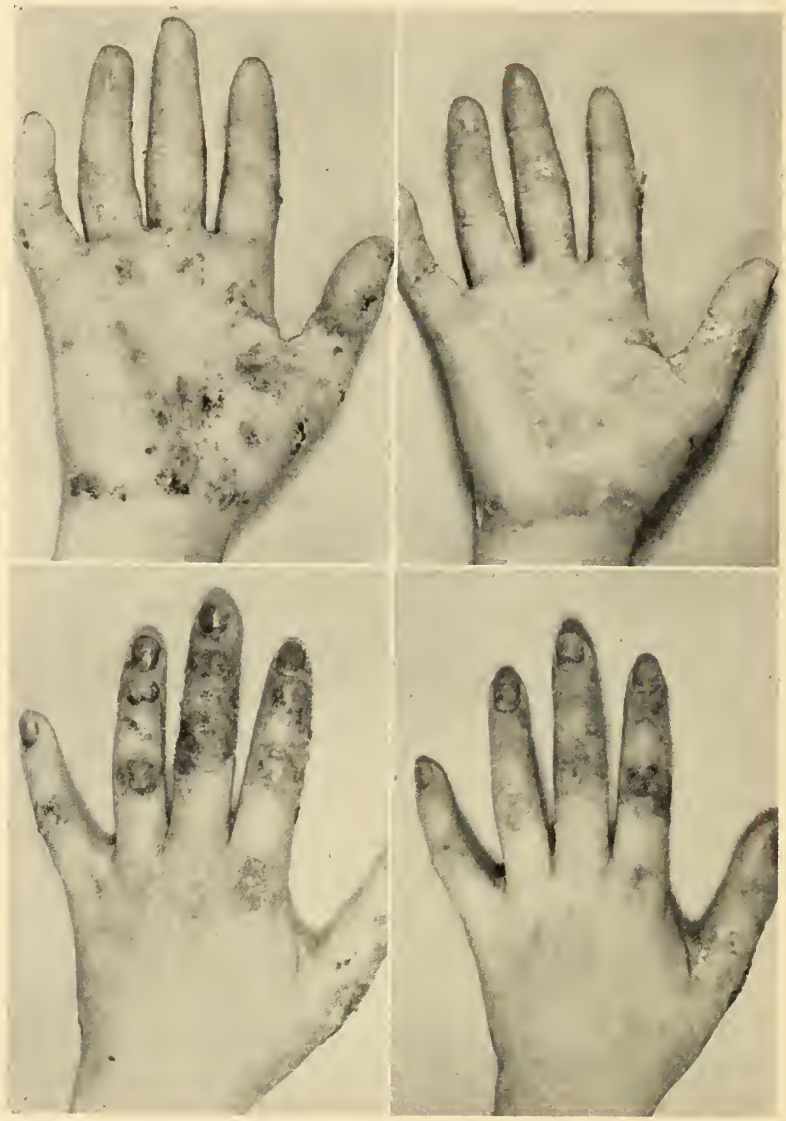


Fig. 1. (*upper left*) Case 27. Pyoderma, mixed infection. Right hand before treatment.

Fig. 2. (*upper right*) Case 27. Right hand after three and one-half days' application of urea-lactose-sulfathiazole wet packs.

Fig. 3. (*lower left*) Case 27. Left hand before treatment.

Fig. 4. (*lower right*) Case 27. Left hand after three and one-half days' application of 3 per cent sodium sulfathiazole wet packs. Still marked activity.

We have been fortunate in encountering two cases of wide-spread pyodermas the organisms of which were shown to be coagulase-positive, hemolytic *Staphylococcus aureus*, both of which were shown to be markedly sulfonamide-fast by

Case Reports

Case 1.—R. S., a four-year-old girl, was admitted on January 14, 1942, to the pediatrics service of the University Hospital, on account of an empyema in the right pleural cavity, which developed following pneumonia. During hospitalization, she developed, in March,

numerous furuncles which were unsuccessfully treated by oral and topical sulfonamide therapy. She was seen by us in consultation on June 19 for a crusted pyoderma involving the right buttock, thigh, and the right side of the chest. Topical sulfonamide therapy was again instituted but the lesions spread and resisted therapy. On July 15 cultures were shown to contain a sulfonamide-fast Staphylococcus aureus. On July 17 an ointment containing 40 per cent urea and 5 per cent sulfathiazole in Hydrosorb (Abbott) was applied and all the lesions were completely healed within six days.

Case 2.—M. R., a thirteen-year-old girl, was admitted to the dermatology service on May 7, 1942, for a large pyogenic granuloma involving two thirds of her left ring finger. The patient had an ulcerative colitis for some years and was in very poor condition. During her hospitalization, several hundred pyogenic lesions developed which eventually ulcerated on both legs, arms, and neck. Sulfathiazole was applied locally in form of powders, ointments, and wet packs, with no response. On July 22, the causative organism was shown to be a coagulase-positive, hemolytic, sulfonamide-fast *Staphylococcus aureus.* Since both legs were equally involved, we considered it an ideal test case to compare applied sulfathiazole alone on one side, with a urea-sulfathiazole mixture on the other. Saturated sulfathiazole in saline was applied to the left leg, and 40 per cent urea, 20 per cent lactose, 5 per cent sulfathiazole in water was applied to the lesions on the right leg as wet packs. Five days after the treatment was instituted, the urea treated side showed clean, pink granulation tissue, whereas the left side showed no change (Figs. 5 and 6).

Due to numerous complications, such as the patient's low resistance and her poor general condition, we were unable to obtain further beneficial effect with the strong urea therapy. This case will be reported in detail at a later date.

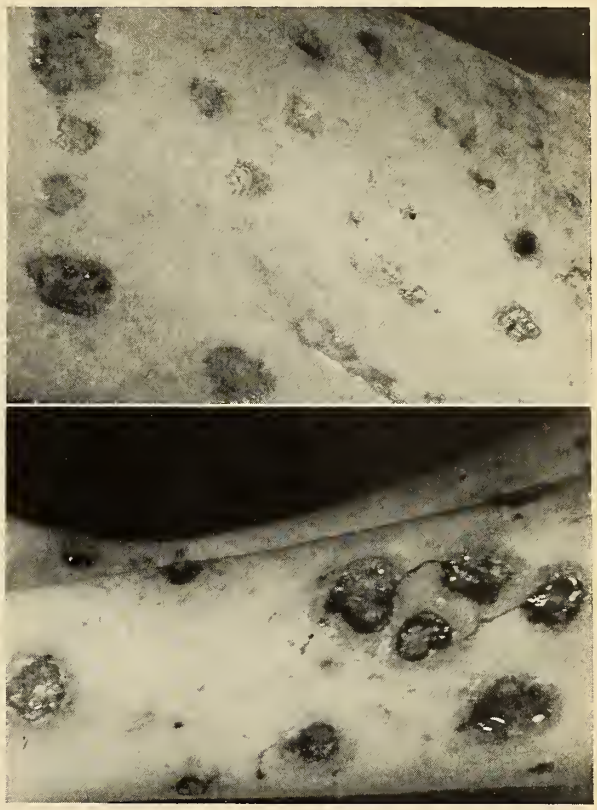


Fig. 5. (*above*) Case 2 (Part II). Lateral aspect of right leg after five days of urea-lactose-sulfathiazole wet packs application.
Fig. 6. (*below*) Case 2 (Part II). Left leg after five days of wet packs of saline solution saturated with sulfathiazole.

Discussion

Of the twenty-eight cases reported in part I, only five were not definitely benefited by the urea-sulfathiazole mixtures as compared with the sulfathiazole alone. One was a border-line case, and one was discontinued because of caustic action of the sodium salt of sulfathiazole, rendering the case uncontrolled.

We cannot explain the three definitely negative cases except to comment that the causative organisms may vary in their response to urea-sulfonamide therapy, under the clinical conditions present. A similar difficulty was experienced by Neter[9] who later recovered staphylococci after apparently successfully treating a wound infected with sulfonamide-fast staphylococci with azochloramid and sulfonamide.

The effect of urea in removing sulfonamide-fastness, is the first clinical report of this nature, other than Neter's preliminary abstract, in which an azochloramid-sulfonamide mixture was used. The importance of a method of combating sulfonamide-fastness will be, in our opinion, strongly emphasized in future applications of chemotherapy.

The advantages of urea in the treatment of infections, discussed in the introduction, should be reëmphasized at this point, namely—(1) its cleansing effect by removing necrotic tissue by lytic action; (2) it is bacteriolytic; (3) it deodorizes foul-smelling infections; (4) it stimulates granulation and vascularization;[1,2,4,10] (5) it is hyperemic; (6) it increases the solubilities of sulfonamides;[4,13] (7) it enhances sulfonamide bacteriostasis, antagonizes sulfonamide inhibitors and removes fastness of sulfonamide resistant organisms;[19,20] and last but not least (8) it is very inexpensive.

It must be pointed out that in our opinion strong urea therapy should be discontinued as soon as fresh, uninfected granulation tissue ap-

pears, since animal experiments on skin defects in rabbits,[10] guinea pigs,[2] the animal experiments of Brush and Conrad,[1] and the clinical experience published by Lange-Sundermann[6] in 1940 and confirmed by our observations have shown strong urea to be inflammatory. New granulation tissue which is contiguous with infected areas may be protected from continued urea treatment with ointment, as pointed out by Lange-Sundermann. Animal experiments have shown that strong urea suppresses epithelization and stimulates granulation in uninfected skin wounds.[1,2,10]

Summary

1. A strong urea-sulfathiazole mixture in wet packs, in ointments, and as a powder, has been compared with sulfathiazole alone in twenty-eight cases of bilaterally infected dermatoses, where sufathiazole alone was applied to one area and the mixture to the other area of the same patient. Urea-sulfonamide therapy gave much better results than sulfonamides alone.

2. Urea and sulfonamides topically applied in two cases of extensive pyodermas due to a sulfonamide-fast staphylococcus brought about successful therapeutic results.

3. The mechanism of the action of the urea-sulfonamide synergism is discussed.

We wish to thank Dr. H. M. Tsuchiya and Mr. D. J. Tenenberg for the bacteriological work; Doctor W. W. Spink for his coöperation and advice and Dr. I. McQuarrie for giving us permission to include case No. 1 (part II) in this report. We also wish to thank Miss H. F. Bruce for her brilliant coöperation in preparing various pharmaceuticals.

References

1. Brush, B. E., and Conrad, R. L.: The effect of the topical application of several substances on the healing of experimental-cutaneous wounds. Surgery, 12:355, (Sept.) 1942.
2. Clark, W. G., Danielson, R. N., Strakosch, E. A., and Moore, G.: Manuscript in preparation.
3. Helmholtz, H. F.: The effect of acidity, mandelic acid, and methenamine on four strains of E. coli, resistant and non-resistant to sulfathiazole. Proc. Staff Meet. Mayo Clinic, 17:353 (June), 1942; *also* the variations of the bactericidal effect of sulfathiazole on different strains of E. coli., ibid., 17:202, (April) 1942.
4. Holder, H. G., and MacKay, E. M.: Wound therapy, with special reference to application of carbamide-sulfonamide mixtures to contaminated and infected wounds. Military Surg., 90:509, (May) 1942.
5. Holder, H. G., and MacKay, E. M.: Personal communications.
6. Lange-Sundermann: Die Madentherapie in asthetischer Form zur Behandlung schwer infizierter Kriegsverletzungen. Münch. med. Wchnschr., 38:1017, (Sept.) 1940.
7. Marshall, E. K., Jr.: Bacterial chemotherapy. Ann. Rev. Physiol., 3:643, 1941.
8. Neter, E.: An in vitro study of the synergistic action of sulfamido compounds and azochloramid upon various pathogenic organisms. Jour. Pharm. and Exp. Therap., 74:52, (Jan.) 1942.
9. Neter, E.: Effects of azochloramid and sulfonamides in localized infections of man. Jour. Bacteriol., 44:261, (Aug.) 1942.
10. Olson, M., Slider, E., Clark, W. G., and MacDonald, R.: Effect of urea in sulfonamide base on healing of clean wounds in rabbits. Proc. Soc. Exp. Biol. and Med., 49: 396, (March) 1942.
11. Pillsbury, D. M., Wammock, V. S., Livingood, C. S., and Nichols, A. C.: The local treatment of pyogenic cutaneous infections with sulfathiazole in emulsion bases. Am. Jour. Med. Sci., 202, 808, (Dec.) 1941.
12. Schmidt, L. H., Selser, C., and Dettwiler, H. A.: Studies on sulfonamide-resistant organisms. Jour. Pharm. and Exp. Therapy., 74:175, (Feb.) 1942.
13. Sobin, S. S.: Sulfonamide solubility in urea. Jour. Lab. Clin. Med., 27:1567, (Sept.) 1942.
14. Spink, W. W.: Sulfanilamide and related compounds in general practice. 2nd Edition. Chicago: Year Book Publishers, (Sept.) 1942.
15. Stokinger, H. E., Charles, R. Ch., and Carpenter, C. M.: The rôle of p-aminobenzoate in experimentally developed sulfonamide-fastness in the gonococcus. Jour. Bact., 44: 216, (Aug.) 1942.
16. Strakosch, E. A.: Ointment base studies. Staff Meet. Bull. Hosp. Univ. of Minnesota, 13:236, (Feb.) 1942.
17. Strakosch, E. A., and Olson, V. T.: Bacteriostatic action of sulfathiazole from various ointment bases. Arch. Derm. and Syph., 46:44, (July) 1942.
18. Tredway, J. B., and Sadusk, J. F.: Observations on the response in vitro of pneumococcus, staphylococcus, alpha hemolytic streptococcus, and Lander's bacillus to the sulfonamide drugs. Yale Jour. Biol., 14:143, (Dec.) 1941.
19. Tsuchiya, H. M., Tenenberg, D. J., Clark, W. G., and Strakosch, E. A.: Antagonism of anti-sulfonamide effect of methionine and enhancement of bacteriostatic action of sulfonamide by urea. Proc. Soc. Exp. Biol. and Med., 50, 262, (June) 1942.
20. Tsuchiya, H. M., Tenenberg, D. J., Clark, W. G., and Strakosch, E. A.: Proc. Soc. Exp. Biol. and Med., 51:245, (Nov.) 1942.
21. Vivino, J. J., and Spink, W. W.: Sulfonamide-resistant strains of staphylococci: clinical significance. Proc. Soc. Exp. Biol. and Med., 50:336 (June), 1942.

TREATMENT OF CRANIOCEREBRAL INJURIES IN MODERN WARFARE

GEORGE S. BAKER, M.D. and ALFRED W. ADSON, M.D.
Rochester, Minnesota

IN the present world war, as contrasted to the one of 1914-1918, changes in the type of explosives have produced changes in the type of craniocerebral injuries that are inflicted. It is estimated that in the first world war about 9 per cent of the wounds were caused by shells and about 90 per cent were caused by bullets. In modern warfare this ratio has been almost reversed. German high-explosive bombs are known to contain 90 per cent explosive material and only about 10 per cent of aluminum alloy casting, a type of construction which makes them very light for transportation by air. These bombs usually kill by the terrific blast they cause, rather than by projection of small fragments of their casings. However, these small fragments travel at an extremely high velocity and can cause dev-

From the section on Neurology and Neurosurgery, The Mayo Clinic, Rochester, Minnesota.

astating damage to the soft parts of the body as well as to the skull and cerebral tissues. A small wound of entry through the skull may lead to extensive damage to the underlying portion of the brain; therefore, what seems to be a minor laceration of the scalp may, at a later time, prove to be a very serious craniocerebral injury.

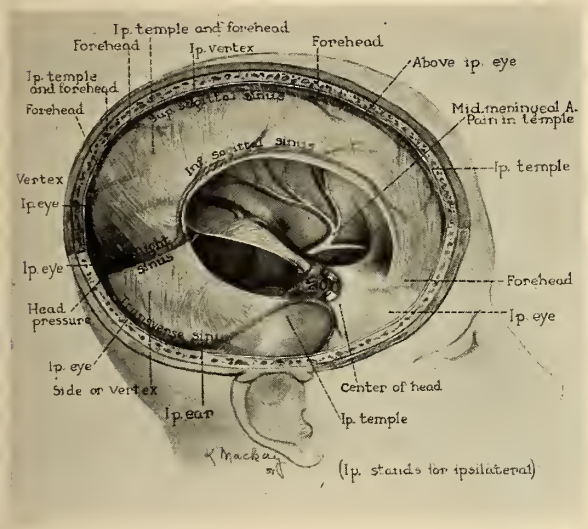


Fig. 1. Anatomic relationships of the falx and tentorium to the long processes of the skull.

General Considerations

In any consideration of damage to the skull and the soft parts within, the anatomic relationships of the brain and its coverings must be at least mentioned, so that the changes which may occur after cerebral injury can be interpreted. In Figure 1 are represented the anatomic relationships of the falx cerebri and the tentorium and its attachments to the bony processes of the skull. The middle meningeal artery is visualized in Figure 1. This artery often is the source of distress after fractures through the temporal area of the skull. The fibrous structures of the falx and dura in general are more or less fixed, and therefore any pressure which arises within the cranium will necessarily be resisted by the fixed tissues within the skull. The brain, therefore, will receive the major portion of the damage. A rapid increase in intracerebral pressure may shift the brain under the falx, with resulting unconsciousness of the person concerned. In severe trauma to the brain, notching of the cerebral peduncles by the tentorium also may occur; this usually results in spasmodic rigidity of the extremities in extension as well as various types of tremors of the extremities. When the increase in intracranial pressure is very slow, the brain is able to accommodate more or less for the pressure; hence the symptoms are not so marked as those of persons in whom this pressure increases very rapidly. Other anatomic changes which can be demonstrated are unilateral shifting of the brain, caused by the encroachment of a subdural hematoma as demonstrated in Figure 2*a*, and herniation of the cerebellar tonsils through the foramen magnum as in Figure 2*b*, which may follow spinal puncture carried out to control increased intracranial pressure or may follow spontaneously some sudden increase in intracranial pressure. This change may be accompanied by respiratory collapse or symptoms referable to the respiratory mechanism. Any of these anatomic variations of the pathologic changes may occur

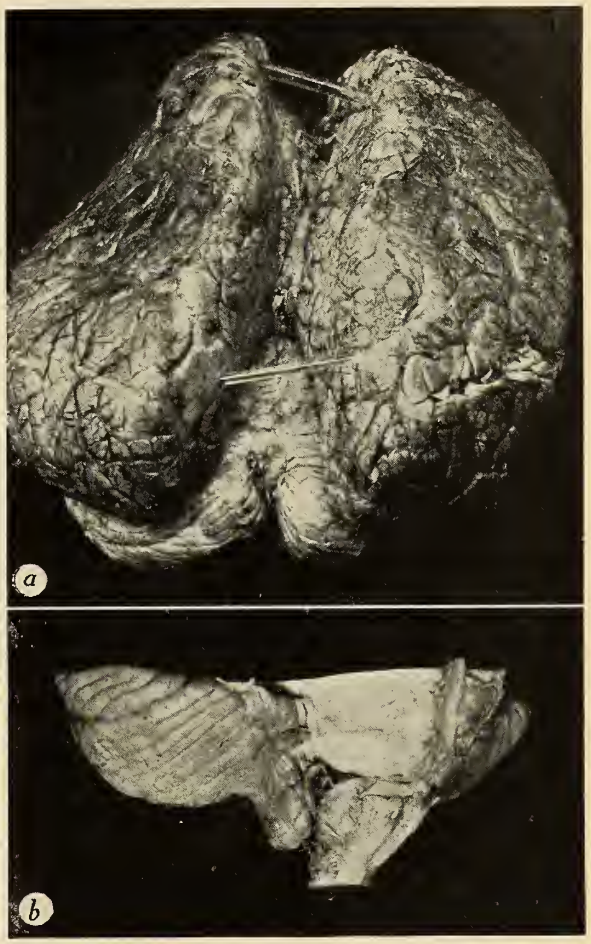


Fig. 2. *a*. Compression of the brain caused by a large subdural hematoma, showing shifting of the brain under the falx; *b*, herniation of the cerebellar tonsils through the foramen magnum, with compression of the medulla.

within the skull after injury. It is with those patients whose intracranial pressure shows a very rapid increase that we are most concerned in this discussion of war injuries to the craniocerebral tissues.

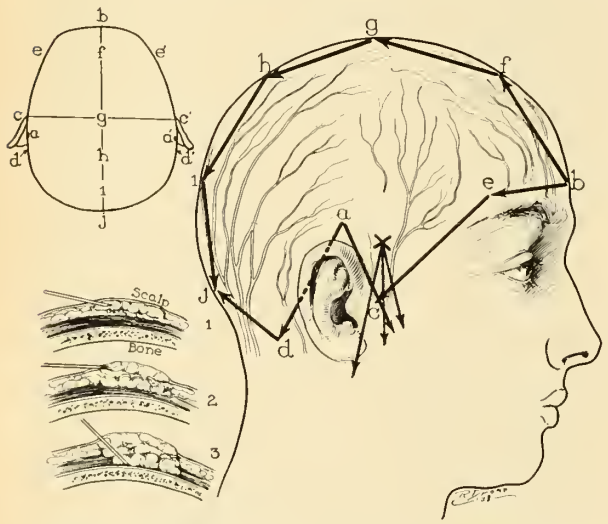


Fig. 3. Technique of the injection of the scalp by local infiltration (from Lundy).

Treatment

Primary Considerations. — The treatment of craniocerebral injuries is operative or nonoperative. When the surgeon is confronted with a craniocerebral injury during a military engagement, he must consider first the availability of proper materials and methods of treatment, and must by all means evaluate the severity of the injury. Under military conditions, it is advisable to treat the men who have received minor injuries first, so that they can return to their posts of duty. Severely injured patients can be cared for during a lull in activities. The physician who is to care for a patient suffering from severe craniocerebral injury must first evaluate the extent of the injuries to that patient in their entirety, and not merely from the standpoint of his specialty. Even though the damage to the brain and soft parts may appear to be very serious at the time, penetration of the abdomen with but a small fragment of shell may be much more serious, so far as the patient's life is concerned, than a cerebral injury itself. Therefore, the most serious injury must be treated first, and in the case of penetration of an abdominal viscus the wound of course should be sutured at once to avoid or overcome peritonitis; then the other injuries can be treated at a later time. It may be necessary to employ several surgical teams to expedite the proper treatment.

First Aid and Emergency Treatment.—In the outlying collecting stations which are adapted to the military needs of the advancing army, first aid and emergency treatment can be administered. It is therefore advisable that those rendering first aid treatment have an ample supply of powdered sulfanilamide and also first aid dressings by means of which chemotherapy can be instituted locally against all wounds. Superficial hemorrhage should be controlled and the patient should be carefully transported to the proper unit for treatment. The patient may be severely shocked because of loss of blood or exposure to cold; therefore, the treatment of shock is always a major problem during a military campaign. Oxygen can be administered by the mask method. Heat can be applied to the extremities by hot water bottles and blankets. Too much heat, however, may be detrimental. Loss of blood always can be replaced by the administration of plasma or the transfusion of whole blood, if donors are available. Sedative agents can be used, and in the case of craniocerebral injuries, barbiturates such as pentobarbital sodium, pentothal sodium, chloral hydrate and paraldehyde are to be recommended instead of morphine and its derivatives. After emergency treatment has been rendered and the shock has been controlled, a more detailed evaluation of the extent of the craniocerebral injury can be made by careful neurologic examination and by roentgenologic studies of the skull.

Nonoperative Treatment.—Not all craniocerebral injuries require operative treatment. Mild injuries with or without unconsciousness, linear fractures, small depressions of the skull, absence of lacerations of the scalp and of hemorrhage, ordinarily do not require a surgical procedure. The treatment of choice for such persons involves use of supportive measures such as fluids (2,000 c.c. per day) and control of pain by the administration of barbiturates, chloral hydrate or codeine. When a dehydrating program is indicated, a 10 per cent solution of glucose can be used intravenously, and magnesium sulfate can be given by mouth and by enema. Spinal punc-

ture has been debated greatly, both pro and con, with respect to its use in the treatment of craniocerebral injuries. In selected cases in which the initial pressure can be estimated by manometric methods and the spinal pressure can be lowered to only a half of the initial pressure, very few serious complications would be expected. The convalescent care will depend upon the extent of the injury and the manner in which healing takes place.

In Figure 4*a* and *b*, the roentgenograms disclose a compound comminuted fracture of the skull. Compound comminuted fractures of the skull perhaps comprise the most serious of all injuries sustained during a military engagement.

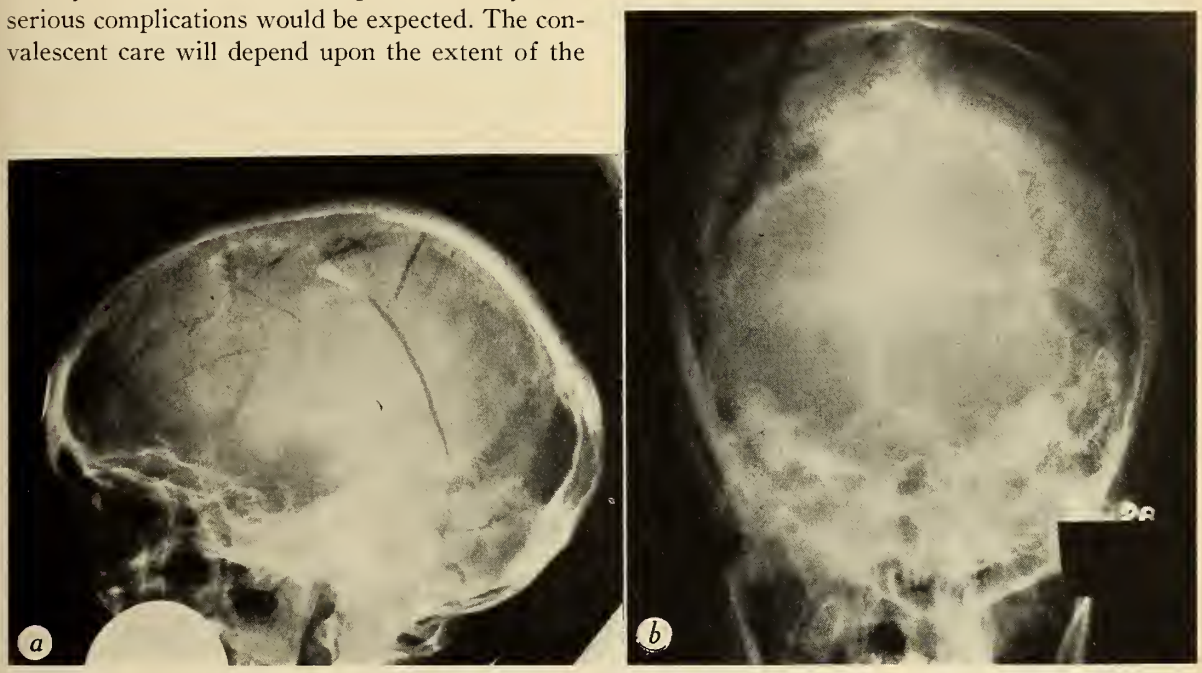


Fig. 4. Compound comminuted fracture of skull; *a*, lateral vew; *b*, posterior view.

Operative Treatment. — Lacerations of the scalp, compound fractures of the skull, depressed fractures of the skull, hemorrhages (extradural, subdural, and intracerebral and intraventricular), and the removal of foreign bodies, ordinarily necessitate an operative procedure.

Lacerations of the Scalp.—Lacerations of the scalp require a careful and painstaking débridement under local anesthesia or intravenous anesthesia with pentothal sodium. In Figure 3 are represented the nerve supply to the scalp and the manner in which an agent for the production of local anesthesia should be infiltrated into the scalp. The scalp should be shaved and cleaned with green soap and sterile water. Tincture of merthiolate and sulfanilamide powder can be used antiseptically in the wounds. The edges of the wound can be sutured with silk or silkworm catgut, and it is rarely necessary to institute drainage. Tetanus and gas gangrene antitoxin should be administered.

For some of the patients it is necessary to employ anesthesia, and in such cases, ether administered by the drop method over an intratracheal tube can be used when available. Local infiltration of the scalp with benzoyl-gamma-(2-methyl-piperidino)-propanol hydrochloride (metycaine) or procaine hydrochloride probably is the method of anesthesia most widely used in this type of emergency. The ideal treatment of this group of patients probably approximates rather closely the outline which follows.

Compound Comminuted Skull Fractures.—In the presence of such injuries the surgeon should:

1. Carry out débridement of scalp, fragments of skull and herniated brain
2. Elevate and remove bony fragments and foreign materials
3. Remove foreign bodies and metallic missiles when possible
4. Aspirate necrosed portions of brain from traumatic sinuses
5. Irrigate traumatic sinuses with a suspension of sulfanilamide in sterile water

6. Dust the surgical field with sulfanilamide
7. Close the dura when possible with interrupted sutures of fine chromic gut
8. Close the scalp with interrupted sutures
9. Use Penrose wick drains if injury is of more than six hours' duration
10. Administer tetanus and gas gangrene antitoxin
11. Administer sulfanilamide orally, being extremely careful not to overdose.

In the presence of comminuted fractures with depression of bone (Fig. 5*a*), it is necessary to elevate the fragments and then replace them, if possible. However, any fragmented portion of bone which is entirely separated from the periosteum should be considered as a foreign body and removed at the time of the initial operation. At times, in civilian practice, in the region of the orbit (Fig. 5*b*), the pieces of bone can be replaced when they are still attached to the periosteum and they may heal with very good results. During military engagements, however, this may not be advisable because of the risk of infection and subsequent formation of brain abscess and osteomyelitis. Basilar fractures should be treated according to the nonoperative dehydrating program unless severe hemorrhage occurs within the skull. It may be necessary to explore surgically through a temporal approach, to control the hemorrhage and then to follow the dehydrating program. Fractures of the skull which extend through the nasal sinuses or into the middle ear can be treated as compound comminuted fractures, in the case of the nasal sinuses, and as a basilar fracture in the case of the middle ear. A cerebrospinal fistula may result in either case and may require a surgical repair by an intracranial operation after the injuries to the brain have subsided.

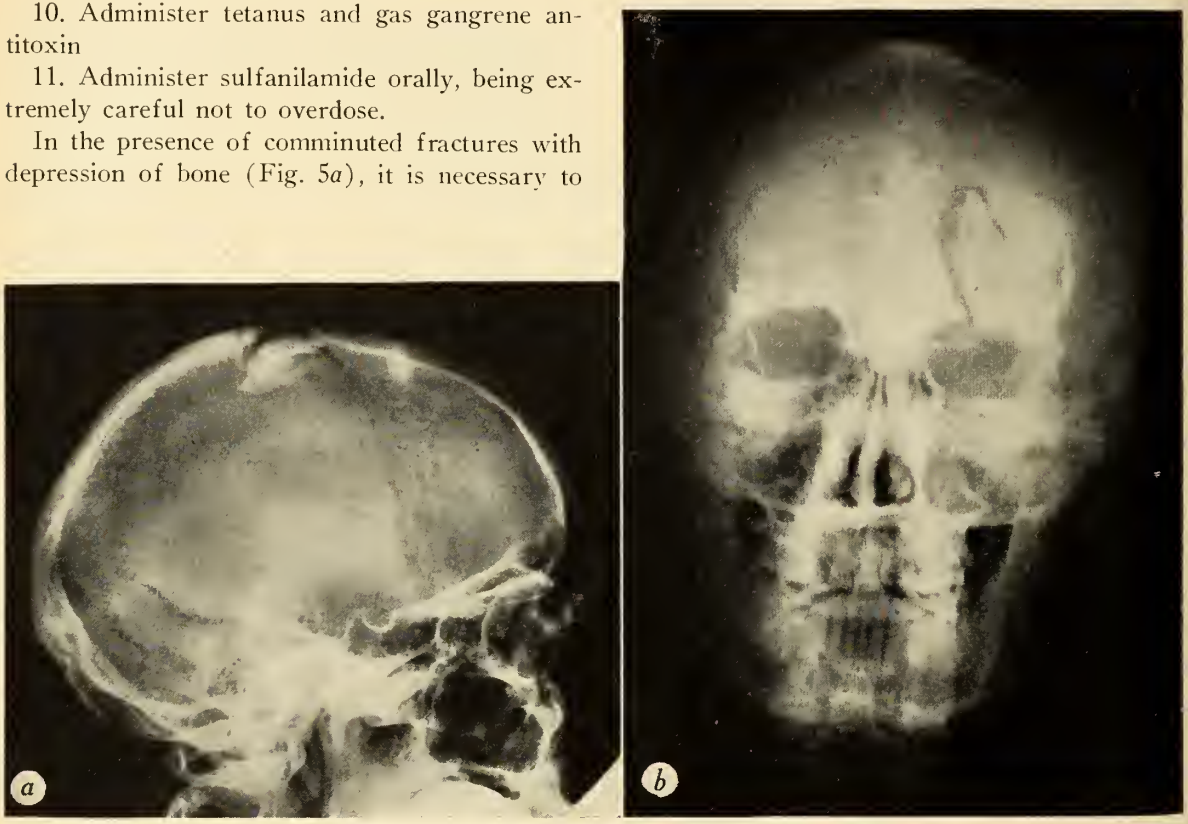


Fig. 5. *a*, Compound depressed fracture of the skull; *b*, fracture of the skull through left frontal sinus, with extension into the left orbit.

Hemorrhages.—There are four types of hemorrhage which may be encountered within the skull: (1) extradural, (2) subdural, (3) intracerebral and (4) intraventricular. Extradural hemorrhage usually results from a tear of the middle meningeal artery and usually is associated with a very rapid onset of symptoms, such as unconsciousness and hemiplegia on the contralateral side and, frequently, a dilated pupil on the homolateral side. In such a case it is necessary to trephine the skull through the temporal region and evacuate the clot. The injured portion of artery can

be treated by electric coagulation or ligated with silk or catgut sutures.

Subdural hematoma is very slow in onset and produces very gradual compression of the brain, as was demonstrated in Figure 2*a*. It may require weeks or months before the symptoms are recognized. Drainage of the old blood through multiple trephine openings in the skull usually is sufficient to relieve the patient, but at times craniotomy is necessary to permit evacuation of an organized clot.

Intracerebral hemorrhage can be treated by evacuation of the clot and institution of drainage through the traumatic defect in the skull, or by craniotomy.

Intraventricular hemorrhage is to be treated as acute internal hydrocephalus: by ventriculostomy and drainage.

Postoperative Care.—The postoperative care of patients who have received surgical treatment for craniocerebral injuries usually will approximate the outline which follows. The surgeon should:

1. Limit the intake of fluids to 1,800 c.c. for three days
2. Increase the intake of fluids gradually to normal values after three days
3. When sulfanilamide is used, control concentration so that it is between 8 and 10 mg. per 100 c.c. of blood
4. Continue the use of sulfanilamide for ten days unless there is evidence of craniocerebral infection
5. Afford ample drainage of infected wounds
6. Remember that brain abscesses are most effectively drained after encapsulation has taken place (duration of two to three weeks)
7. Institute dehydration, if it is necessary, to combat cerebral edema during the first three to six days, accompanied by (a) the intravenous administration of 1,800 to 2,000 c.c. of a 10 per cent solution of glucose per day; (b) the daily oral administration of magnesium sulfate, or 2 ounces of it (60 c.c.) in 3 fluid ounces (90 c.c.) of water given as an enema
8. Perform spinal drainage occasionally as indicated, when the patient is very restless
9. Avoid the occurrence of excessive dehydration
10. Administer 1½ grains (0.1 gm.) of phenobarbital twice daily to prevent convulsions
11. Institute feeding by tube if patient continues to remain unconscious after three days; this is to be accompanied by the giving of nourishment, proper amounts of vitamins and an occasional saline cathartic agent
12. Control pain and restlessness by use of the more potent barbiturates, such as nembutal, and when the patient has extreme pain, pentothal sodium.

Convalescent Treatment.—Convalescent treatment sometimes is a major problem in war casualties. Rest in bed is advisable until the patients' wounds are healed, unless the patients are mentally alert, in which case they may be permitted to be up five or six days after surgical treatment. They should be encouraged to return to active duty when their sense of well-being has returned. They should be given assurance that they are able to carry on their duties in a manner similar to that which existed prior to their injuries. For those unfortunate patients who have been maimed or in whom traumatic aberrations have developed, vocational guidance should be arranged so that they can be taught occupations, and can enjoy their existence in spite of their handicaps.

Sequelæ.—Many sequelæ may develop after a craniocerebral injury. Posttraumatic headache and vertigo are rather common. Among those patients who have received severe damage to the brain, monoplegia or hemiplegia may occur and remain permanently. Posttraumatic epilepsy occurs among a fair percentage of patients, and it is wise to wait two years before determining whether or not epilepsy will develop in a patient after damage to the brain. Meningitis may follow infection of the brain, and should be attacked specifically by chemotherapy when the causative organism can be isolated. Brain abscess should be drained after the infection has localized and the capsule has established itself. Cerebrospinal rhinorrhea may predispose to meningitis and brain abscess, and should be treated surgically by intracranial closure of the rent in the dura. Traumatic neuroses and psychoses are common occurrences among men in military engagements who have received minor injuries. They are also common among people who are not under the stress and the strain of a military engagement. Cerebral herniation may follow large

(Concluded on Page 308)

CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL

A. J. Hertzog, M.D., and S. V. Loisness, M.D.
Pathologists

Presentation of a Case

Dr. Moosnick: This is the case of a nineteen-year old unmarried girl admitted to the contagion service of this hospital on December 28, 1942. She was complaining of malaise, weakness, headaches, vomiting, swelling of her ankles and bleeding from nose and mouth. Her medical history began at the age of six years when she suffered an attack of what she described as acute kidney disease. She had to remain in bed for several weeks. After this period in bed, she led a normal life and went to school. At puberty, although her breasts and other secondary sex characteristics developed normally, she never menstruated. Two years ago, in 1940, she noticed for the first time slight swelling about her eyes on awakening in the morning. In 1941, she noticed that she tired rather easily and suffered from vague muscle and bone aches. She could not specifically state what was wrong. In 1942, she was treated by a physician for the persistent amenorrhea with a series of estrogenic hormone injections. These were given as frequently as four or five times a week without producing any change in her menstrual status. In November, 1942, she applied for work at one of the defense plants and was rejected because of severe albuminuria and a systolic blood pressure of 180 mm. She applied at another plant and was accepted after a physician examined her urine grossly. She stated that he had only looked at the specimen. She worked for about two weeks but had to resign due to increasing weakness and moderate shortness of breath on exertion. At this time she noticed for the first time urinary frequency and nocturia, and persistent nausea and vomiting. She began to bleed from the nose and mouth and developed a pustular eruption over the face. She remained in bed at home for a few days and then was admitted to a private hospital. Her physicians found evidence of uremia and of marked anemia—her hemoglobin was only 26 per cent. She was given twelve small blood transfusions which raised her hemoglobin, but the bleeding tendency persisted. Her throat became congested and ulcerated and culture showed diphtheria bacilli, so she was transferred to the contagion service of this hospital. Her family history was pertinent in so far as her mother had suffered from severe hypertension and had died at the age of forty-eight years, shortly after the birth of a child.

Physical examination on admission revealed a well developed, stocky girl of nineteen years. There was a uriniferous odor to her breath. She was lethargic, responded poorly to questioning, and appeared very ill. The skin showed numerous diffuse petechial hemorrhages and a few pustules, mainly on the face. The breasts were well developed. The mucous membranes of the mouth and throat showed numerous small ulcerations and bled rather easily. Her temperature was 100.4. Blood pressure was 130/115. The pulse rate was 100 per minute. A soft systolic murmur was present at the apex of the heart. The lungs were clear. Abdominal examination revealed nothing of note. A pelvic examination was not done. The eyegrounds showed marked bilateral hemorrhages and exudates.

A throat culture showed diphtheroid organisms resembling Corynebacterium diphtheriæ. However, these proved to be nonvirulent after guinea pig inoculation, so she was transferred to the medical service. Four urinalyses showed a specific gravity that varied from 1.010 to 1.017; albumin from 3 to 4 plus; red blood cells varied from 3 to 15 per high power microscopic field. A few leukocytes were also present but casts were not seen. Blood urea nitrogen varied from 188 to 194.6 mg., creatinine from 9.4 to 11.5 mg., and uric acid was 15.4 mg. Hemoglobin determinations ranged from 77 to 66 per cent (Sahli). Red blood counts varied from 3,860,000 to 3,260,000, and white blood cells from 6,600 to 9,900. A platelet count was 94,000. Differential counts showed 82 to 95 per cent neutrophiles. The leukocytes were toxic and the red blood cells showed slight anisocytosis, hypochromasia and polychromahtophilia. A sternal bone marrow aspiration was done. The marrow was reported as showing toxic regeneration of the erythroid and myeloid elements. There was a marked diminution of megakaryocytes with little tendency to platelet production. A sedimentation rate was 89 mm. for one hour. Bleeding time was 15 minutes, and coagulation time was more than 9 minutes. The prothrombin level was 62 per cent. Total plasma proteins were 6.9 grams. The carbon dioxide combining power of the plasma was 60 volumes per cent.

She was given a blood transfusion and treated symptomatically, but her condition rapidly became worse. Her mild fever persisted and she bled intermittently from the nose and mouth. She vomited frequently, and developed a cough productive of a small amount of bloody sputum. Her urinary output was 200 to 600 cc. daily. She remained stuporous, muscular twitching appeared in her face, her breathing became irregular and she died on January 1, 1943.

Dr. Hertzog: The history of kidney disease in this case goes back for thirteen years. The story is that

of chronic glomerulonephritis with a slowly progressing renal insufficiency. This case shows the necessity to perform guinea pig inoculations as a virulence test before finally accepting any diphtheroid organism as pathogenic, especially in the clinical absence of diphtheria. Did anyone have an explanation for the amenorrhea?

DR. MOOSNICK: We had none. We did not do a pelvic examination because her condition was critical. The history was of no help. We only knew that she had received parenteral therapy for the amenorrhea over a period of months with no benefits.

INTERN: What type of skin lesions did she have?

DR. MOOSNICK: She had two types of skin lesions. One was diffuse petechial hemorrhage and the other was small pustules.

PHYSICIAN: Did she have any evidence of heart failure?

DR. MOOSNICK: She had no physical evidence of heart failure. Her venous pressure was 10 cm.

DR. HERTZOG: The laboratory findings in this case are obviously those of uremia. It is of interest that no casts were found in her urine. We can attribute the anemia largely to chronic nitrogen retention. Anemias in cases of azotemia are usually of the normocytic variety and respond poorly to therapy. Significant lowering of the blood values is not common unless the blood urea nitrogen remains for some time above 50 mg. per cent. This has apparently a direct inhibitory effect on the bone marrow. The specific factors in connection with the azotemia that are responsible for this effect are not known. Purpuras are not uncommon with uremia. In this case both the peripheral blood and the bone marrow showed a thrombocytopenia. The bleeding and coagulation times were prolonged. A cuff test for capillary resistence would probably have shown increased capillary permeability.

STUDENT: Did she have an upper respiratory infection before admission?

DR. MOOSNICK: It was difficult to tell because she had dried blood and dried secretions in her nose and throat.

DR. HERTZOG: If there are no further questions or discussion, Dr. Lofsness will give the autopsy findings.

DR. LOFSNESS: The body was rather short, being only 4 feet, 10 inches in length, but it was well developed and well nourished. There was slight edema of the face and ankles. There was a skin eruption as Dr. Moosnick described. There was a small absess at the tip of the left ring finger. The right pupil was smaller than the left and a hemorrhagic conjunctivitis was present on the right. The abdominal cavity contained approximately 500 cc. of clear fluid. The liver weighed 1300 grams and showed no gross evidence of passive congestion. The spleen weighed 100 grams and appeared normal. The heart weighed 325 grams and showed slight hypertrophy of the left ventricle. The right lung weighed 625 grams and the left 340 grams. Both showed patchy areas of hemorrhagic broncho-pneumonia, especially the right lower lobe. Both adrenal glands were situated in their normal position but underlying kidneys were not found. A search of the pelvis revealed a single mass attached to the bladder. This proved to be a solitary kidney. The ureter was only 10 cm. long and showed slight dilatation; it entered the bladder on the posterior wall 2 cm. above the urethra. The single kidney weighed 125 grams. The cortex was thin, yellow and pitted as seen in chronic glomerulonephritis. External examination of the genitalia showed normal labia and a normal urethral orifice. There was a dense, imperforate hymen. Further examination of the pelvis revealed a complete absence of Fallopian tubes, uterus and vagina. The ovaries were present. Both were embedded in the lateral pelvic peritoneum. They were of normal size and showed evidence of recent ovulation. The only other significant findings were enlarged parathyroid glands. Four glands were found and these weighed 50 mg., 85 mg., 150 mg., and 150 mg. respectively.

PHYSICIAN: How much larger than normal are these figures for the parathyroids?

DR. LOFSNESS: The upper glands were approximately twice the normal size, while the lower glands were approximately four times normal. Mallory gives 30 to 45 mg. as the average weight of a parathyroid gland. I will now show the microscopic sections from this case. The kidneys show the usual picture of chronic glomerulonephritis. There are many hyalinized glomeruli. The remaining glomeruli are overly cellular and there are a few epithelial crescents. There is extensive tubular atrophy. The remaining tubules are dilated and contain casts. The blood vessels are not remarkable. The next slide is from the lower lobe of the right lung. It shows extensive hemorrhagic bronchopneumonia with the alveoli filled with red blood cells and neutrophiles. The last slide is that of the ovaries. Normal ova and follicles are present. I do not have the slides of the parathyroids to show you as they are at the University; however, they show simple hyperplasia. Hyperplasia of the parathyroids is common in chronic renal insufficiency regardless of its cause. The renal insufficiency leads to a retention of the phosphates, which are ordinarily excreted in the urine, and this depresses the calcium level of the blood. Calcium is excreted by the bowel and this is little influenced by the uremia. Apparently the parathyroids hypertrophy and mobilize calcium from the bones in an effort to maintain the blood calcium at a normal level, but the calcium is excreted as rapidly as made available. If continued long enough, this leads to some osteoporosis. In chidlren, this interferes with growth and may lead to dwarfism. Our patient had no blood calcium determination, but had clinical signs of hypocalcemia, such as muscular twitching.

DR. HERTZOG: Dr. Bell reports a single kidney as occurring in one out of nine hundred persons. Usually the corresponding ureter is entirely absent, but in a small percentage of cases remnants of the ureteral bud may be seen. The single kidney is usually larger than one of normal size. The kidney in this case was smaller than normal because of the chronic glomerulonephritis. Renal agenesis is due to defective development of the mesonephros and the Wolffian duct. The ureteral bud normally arises from the terminal portion of the Wolffian duct and grows to join the metanephric blastema, where it gives rise to the pelvis and the collecting tubules. Due to agenesis of the terminal part of the Wolffian duct, the ureteral bud fails to develop. The metanephric blastema does not differentiate into tubules if contact is not made with the ureteral bud. Congenital anomalies of the genital organs are found in a large percentage of cases of unilateral kidney. Bell estimates that two-thirds of the females with unilateral kidney show malformations of the uterus and tubes due to the close embryological relationship between the kidney and genital organs. In males with unilateral kidney, there is often unilateral absence of the ductus deferens, ejaculatory duct, seminal vesicle and sometimes a part of the epididymis.

Anatomical Diagnosis: (1) Chronic glomerulonephritis; (2) solitary kidney; (3) uremia; (4) congenital absence of uterus, Fallopian tubes and vagina; (5) bronchopneumonia.

HISTORY OF MEDICINE IN DODGE COUNTY

BY JAMES ECKMAN

Rochester, Minnesota

and

CHARLES E. BIGELOW, M.D.

Dodge Center, Minnesota

(Continued from February issue.)

The oft-repeated contention of Professor Frederick J. Turner,[9] that "the existence of an area of free land, its continuous recession, and the advance of American settlement westward explain American development," seems amply confirmed in the case of Dodge County and its physicians. Attracted to the new and rich lands which could be theirs by the simple but by no means easy task of breaking and holding them, they slowly infiltrated the region in the middle fifties, and streamed into it in the sixties in profusion. Once settled, they discovered that the physiologic processes of life and death had been in no wise deterred, however salubrious the new country might have seemed to them. One Morris Dolson was born on May 15, 1854, in what is now Concord, only three days after his mother and father had arrived from Dubuque, and not even a day after a cabin had been erected frantically for the pastoral *accouchement*.[5] It was the first birth in the county. During the fall of 1854 and the winter of 1855, in what is now Milton Township, the people were afflicted with smallpox, "which the Indians transmitted to a portion of the settlers."[5] In February of 1855 one Mrs. Mastin died in what is now Kasson, "the first death of a white person in the town or county."[5]

A native of Vermont, **Dr. Josiah R. Dartt** (1824-1874), was the first physician known to have come to Dodge County to remain, and he may have ministered to the settlers stricken with smallpox, for he came to Dodge County in the fall of 1854, according to some.* When Governor Willis A. Gorman (1816-1876) appointed the officers of Dodge County on August 4, 1855, he selected Doctor Dartt as treasurer, an office which the physician occupied only until the ensuing October elections, in which his successor was chosen.[5]

Doctor Dartt may have had some broken heads to mend from time to time, for Nute[10] has shown that in 1855 there existed what was called the "Dodge Centre Claim Society,"** composed of frontiersmen who never shrank from exerting "a little gentle force"[10] when they came upon settlers whom they considered undesirable. Doctor Dartt himself was the executive of a committee of vigilantes formed at Mantorville in 1855.[11]

The venerable **Dr. Samuel B. Sheardown** (1826-1889), first president of the Winona County Medical Society[12] (1869) and treasurer of the Minnesota State Medical Society from its reorganization in 1869 until his death in 1889, seems to have had a part in bringing the next physician to Dodge County. Doctor Shear-

*The authors, as a matter of fact, do not know when Dr. Dartt came to Dodge County, although he did so in either 1854 or 1855. In the biographic section of this essay will be found a more extended discussion of this point, in the sketch of the life of Dr. Dartt.

**But it is to be noted that the *village* of Dodge Center was not founded until 1866.

down was one member of an early company of Winona land speculators, composed of such well-known men as General William Windom (1827-1891), United States Senator Daniel S. Norton (1829-1870) and others, who in the summer of 1855 platted the village of Ashland† in Dodge County as a speculative undertaking in real estate. Associated with them in this venture was **Dr. George W. Townsend** (1832-1910), who built and stocked a store in the new village. He sold this store in the spring of 1856. Eventually, he moved to Steele County.*

At some time in 1855 Doctor Dartt and Doctor Townsend were joined by **Dr. James Mansfield Ryder** (1822-1900), a homeopathic physician. He came from Dryden, Michigan, and like all the pioneer practitioners, took a farm as a homestead. His land was situated in Milton Township, and he lived on it and practiced medicine among his neighbors for about thirty-five years, except for the period of his services in the War of the Rebellion.

Close on the heels of Doctor Ryder came **Dr. Staunton B. Kendall** (1808-1897), who in 1856 pre-empted farm land near Ashland and practiced homeopathic medicine among his neighbors. On May 11, 1858, he was elected first assessor of Ashland. He left Ashland Township in 1862, after "the people became suddenly aware that it was an excellent farming section but that a village of much pretensions would hardly be built."[5]

In the spring of 1856 **Dr. William P. Miller** (1806-1873), a homeopathic physician from Ohio, and **Dr. James A. Garver** (1814-1901), a "regular" physician from Ohio and Indiana, came to Wasioja together. Doctor Miller opened a combination dry goods and drug store and undertook the practice of medicine.[5] No doubt one of Doctor Miller's patients was his own brother, Augustus Miller, who died in the summer of 1856, "the first adult to leave this place [Wasioja] for that undiscovered country, from which none ever return . . ."[5] It was recorded that "Doctors Garver and Miller entered upon the duties of their profession whenever sick people could be found, but the country was so free from disease that they found but little to do."[5]

Dr. James A. Garver likewise settled at Wasioja, where he homesteaded a farm just north of the village. He was a graduate of the Medical College of Ohio and a brother-in-law of Doctor Miller. He remained at Wasioja until 1875, in which year he moved to Dodge Center, where he lived and practiced medicine for the rest of his life.

It might be said, parenthetically, that Doctor Miller and Doctor Garver came to what is still one of the most beautiful sections of Dodge County or even Southern Minnesota. Situated on one of the branches of the Zumbro River, and surrounded by immense white pines which cover the Zumbro bluffs, far west of the general geographic range of these trees, the hamlet of Wasioja more than rewards the traveler with its graces.

Like many another frontier physician, Doctor Garver at first was forced into pursuits other than his chosen profession in his efforts to sustain himself, and he became the manager of a hotel, the Wasioja House, built by the proprietors of the town of Wasioja. How successfully Doctor Garver at least once added to his meager professional fees may be judged from the following paragraph:

> . . . having to leave home one day, he left the house in charge of C. H. Moses, with strict injunctions against receiving more guests than could be comfortably accommodated. Upon returning somewhat late at night, he found his guests stowed away at the rate of three in a bed in each of the rooms, and the "school section" "farmed out" in an equally

†These men gave the name "Ashland" to what is now Ashland Township in Dodge County. See reference No. 17.

*A Dr. George Townsend, however, was practicing medicine in Winona in 1865. The authors do not know that it was the same Dr. Townsend mentioned above.

productive manner, while the sitting room floor was occupied by as many as could find lodging on the carpet. This, though not quite what he would have liked for his guests, was a very good thing for the doctor, and swelled his funds in the sum of $120.[5]

In 1858 he became the first clerk of the Congregational Church of Wasioja, which in 1875 was moved to Dodge Center.

Another arrival in the county in 1856 was **Dr. T. G. Ingraham.** He settled at Concord, where he pre-empted land and served as one of the recorders for the village which was originally platted in the spring of 1856.[5] He erected a general store in association with Benjamin S. Cook (1833-1905) in Concord, and was also chairman of the first board of supervisors and justice of the peace in Concord Township in 1858. It is not known whether he held the degree of Doctor of Medicine. He was a county commissioner in 1859[5] and a county appraiser of school lands in 1864, and it is known that he was in Dodge County until 1865, for early in that year he resigned his post of register of deeds. Mr. Charles Woods,[13] who was born in 1857 on a farm southeast of Concord, reported that he could remember Doctor Ingraham. He said that Doctor Ingraham was the physician who attended his mother when he (Woods) was born.

It was in 1856, also, that typhoid fever killed several members of a German family living in the county,[14] but the disease apparently did not spread further. Venomous snakes seem to have been prevalent in the county in the early days, as Lord[1] has said, and snake-bite probably was a common accident. It was written:[14] "The writer knows two or three persons who also had experience with the effects of snake-bite poison, and who escaped, though not without terrible suffering." It was said that rattlesnakes were discovered in such odd places as a wash boiler, a sleeping man's pocket and in a bedtick filled with hay.[14] On almost any night the settlers could hear the hoarse howling of the prairie wolves, which so far as is known inflicted no wounds on human beings.

It is believed that a **Doctor Sarven** was in Dodge County in 1857, but very little is known about him. He seems to have settled in or near Concord. When the first Dodge County fair was held in Mantorville in 1857, it was said[15] that members of the committee for the fair were Doctor Ingraham, Doctor Townsend, Doctor Rice and Doctor Sarven.

Dr. Edward Payson Kermott (1825-1872), a Canadian eclectic physician, is known to have been in the new village of Rice Lake in 1857. At least part of the time he extracted teeth for the settlers, and there is no reason to believe that he employed an anesthetic agent for such procedures. Doctor Kermott soon moved to Wasioja, it would appear, where in 1860 a son, Edward Plews Kermott (1860-1938), was born to him. This son also became a physician, although he did not practice medicine in Minnesota. The career of Dr. Edward Payson Kermott will be considered later herein.

Several more physicians came to Dodge County during the latter part of the fifties, in spite of the evils to which the settlers were exposed. The *Mantorville Express* during 1857 and 1858 contained the professional card of **W. A. Fessenden, M.D.,** in which it was stated that his office was at his residence and that he lived at Sacramento, Dodge County. Nothing more is known about him.

Sacramento itself is interesting as a "ghost town." It was platted in about 1857 between Wasioja and Mantorville on the Zumbro River, by a calculating fellow who apparently contrived to turn news of the "gold strike" at Oronoco in 1856 to his own advantage. He was said to have buried gold nuggets along the Zumbro River near his townsite to attract those whose imaginations had been inflamed by reports of deposits of gold

along the same stream near Oronoco in Olmsted County.*[16] He shrewdly chose the name "Sacramento" because of its connotation of the California gold fields, it has been said.[17] Sacramento eventually thrived to the point of being able to challenge Mantorville for the county seat in 1857, but was defeated by popular vote. Today all that remains of Sacramento is some old stonework of the mill that was built there when the village was established. The Sacramento House, opened with some pride in May of 1858,[18] was later moved to Kasson, where before it burned it was known as the American House.

On March 25, 1858, the *Mantorville Express* announced that **Dr. Augustus O. Potter** had lectured on "The Use of Alcohol," and it can be assumed that he had been in the county for a time previous to his talk. He came to Mantorville from Pennsylvania, and remained there until the outbreak of the War of the Rebellion, in which he lost his life. Lord[1] called him a "pioneer doctor of more than local renown," with an "unusual talent for surgery."

It was in this year (1858) that Doctor Dartt explored Western Minnesota and the Territory of Dakota. He sent back letters about his trip, in which he said that the soil of the regions he had visited was no better than that of Dodge County.

The physicians who had come to Dodge County were scarcely well settled before the great panic of 1857 swept the land. What effect this panic had on Dodge County is not readily apparent, for it is not described in earlier sources, possibly because it was believed that any reference to it would discourage much-needed emigration. The panic certainly retarded the development of many a town and obliterated others entirely. As Blegen[19] wrote: ". . . every town in Minnesota considered itself a potential metropolis, and town-site speculation reached a frenzy before the panic of 1857 descended like a blight upon the territory." Ashland was one town in Dodge County which was extinguished by the panic of 1857 and other factors.

It is certain that those who lived by the soil, which at this time included the physicians of Dodge County, were sorely oppressed. Bassett[20] wrote: "The West suffered most; for at this time the Crimean war was ended, and a large area was thrown open to wheat cultivation, on account of which the price of that commodity fell from $2 to 75 cents a bushel, entailing ruin to producers and all who depended on them."

One of the effects of the panic of 1857, which surely influenced the influx of physicians to Dodge County, was what seemed to be a catastrophic delay in the construction of railroads within the state. Larsen[21] detailed the situation:

> The panic of 1857, however, struck Minnesota with such force that the railroad companies were paralyzed. It was at this time that the people of Minnesota ventured into the field of public railroad financing. The framers of the state constitution, harking back to the lessons learned from the panic of 1837, specifically forbade the use of state credit for financing private enterprises. The state's credit, however, was precisely what was wanted, and so in the spring of 1858, an amendment to the constitution was voted whereby the credit of the state could be used to the extent of five millions of dollars to aid the construction of railroads. Accordingly, the Minnesota state railroad bonds, for which the lands of the companies were held as security, were issued. For a few months railroad financiers enjoyed a period of frenzied activity. The money secured by the loan of the state credit was dissipated, however, and though some grading was done, not a foot of railroad was built.

*It is interesting to observe that in 1857 an early Minnesota physician, Dr. Charles W. Le Boutillier of Minneapolis, perpetrated a similar hoax by "planting" gold nuggets and gold dust at the head of Nicollet Island at Minneapolis. See: O'Brien, F. G.: Minnesota Pioneer Sketches, Minneapolis, H. H. S. Rowell, Publisher, 1904, pp. 241-242.

Not until the sixties did the railroad penetrate to Dodge County, and when it did it caused some towns to disappear entirely and new ones to arise. Much money pledged by the settlers toward certain railroad ventures or developments was lost irretrievably, and in some cases railroad lines which had promised to include certain towns passed them by completely when roadbeds were built. The history of the iron horse in Dodge County is not felicitous.

To add to such vicissitudes, a terrific hailstorm visited the county in 1858, beating down the grain wantonly and destroying much of the settlers' labors in the establishing of permanent lodgings and settlements. Funds and assistance were obtained from outside the county, and Doctor Garver was one member of a committee that was organized to distribute relief to the stricken pioneers. Some of the disheartened left the county; but by far most of the settlers remained. Doubtless their spirits were cast down and their hearts unsure as to the future. As it happened, however, these were the worst years of the county, and were soon left behind. The years 1859 and 1860 seem to have been favorable ones, in relation to agricultural pursuits.

It is worthy of note that by the summer of 1857 Dodge County had two newspapers: the *Wasioja Gazette* and the *Mantorville Express*, both initiated in the summer of that year.[5]* These were among the first newspapers in the rural areas of the Territory of Minnesota, and it was the privilege of one of them[22] to announce to the settlers of Dodge County the fact that Minnesota had been admitted into the Federal Union:

> Our growth has been so rapid that our Territorial habiliments were entirely unfitted to our needs. The machinery of a Territorial Government was inadequate to meet the wants and demands of the population. The destiny of Minnesota is now in the hands of her own people. May it ever be onward and upward! May she ever be found among the foremost in moral and political reform, as well as in physical wealth and happiness!

In 1857 and 1858 a homeopathic practitioner named **W. H. Rice** seems to have practiced medicine to some extent from his farm about a mile and a half east of Mantorville. The *Mantorville Express* contained several of his professional cards or notices during the aforementioned period, and it is thought that Doctor Rice remained in the county until after the War of the Rebellion. He exemplifies again the pioneer physician who could not subsist on the frontier by the proceeds of his practice alone, and had to resort to the land for a living. Nothing more is known about Doctor Rice.

Nute,[10] speaking for the Minnesota Historical Society in 1926, said that "A very attractive volume of letters and reminiscences of the oldest settlers of Mantorville was received last year by the society," but the authors have not seen this volume, unless it should happen to be the *Recollections of Mantorville*, by Samuel Lord,[1] which they have examined. At any rate, it would be most desirable to learn more about Dr. W. H. Rice, as well as other pioneer physicians who practiced in or near Mantorville.

---

*Files of the *Mantorville Express* owned by the Minnesota Historical Society are remarkably complete. The society also owns a few copies of the excessively rare *Wasioja Gazette* for 1857, 1858 and 1859. See: Minnesota History, 11:95 (March) 1930.

(To be continued in the April issue)

All references will appear at the end of the completed chapter.

President's Letter

TEMPORARY EXPEDIENTS

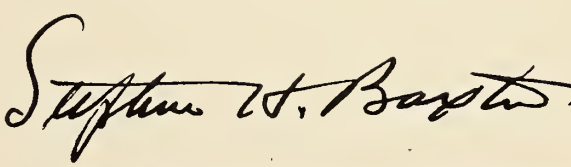
ON February 14, the seventeenth annual meeting of the National Conference on Medical Service was held in Chicago. The importance of this annual conference is probably enhanced by the very fact that it is unofficial, has no membership list, collects no dues, is purely a voluntary body that exists as an organization largely because it has a president and a secretary. It is not in any sense a "pressure group," but may be considered as a fair cross-section of the professions of Medicine, Dentistry and Hospital Administration. All members of these professions are invited to attend the conference and to participate in the discussions. It has no program to champion, no pet schemes or theories to promulgate, but it meets to consider in free and informal discussion, the broad aspects of things which affect the quality of medical service.

Under the general caption, "Analysis of Current Trends in the Control of Medicine," the conditions which confront Medicine, Dentistry, and Hospitals were discussed by leaders in their respective fields. The subjects were different, the personalities of the speakers were different, but a keynote seemed to run, with varying degrees of emphasis and distinctness, through all the addresses. This keynote was struck most clearly by Senator Burton, of Ohio, in his address at the noon dinner of the Conference. He compared the guiding of the course of the nation through a crisis such as exists today, with the plotting of a course for a ship setting out on a long voyage. The navigator must solve both the immediate and the long-distance problems. He will determine the direction that he must follow to reach the distant port and will follow that course by compass and observations of the stars. The immediate problem before him, however, is entirely different. Before he reaches the open sea where he can steer his ship by the stars, he must avoid the rocks and shoals near shore and thread a crooked channel with many changes of direction, steering not by fixed stars but by local landmarks and frequent soundings. These changes in direction are necessary to avoid dangers close at hand, but the experienced navigator will never be deceived by such changes in direction. He will again steer his ship by the stars when he reaches the open sea.

Seductive arguments are put forth favoring the lowering of educational standards in order to hasten the graduation of a larger number of medical students. Sympathies of legislators and governmental officials are played upon, to induce them to relax the restrictions on the practice of medicine, and to permit practitioners whose qualifications are questionable or unknown to practice under a "temporary license."

A wise man once said that there is nothing more permanent than a temporary expedient. Men are prone to follow the line of least resistance and to permit the temporary expedient to become permanent policy rather than to fight to abolish it. Reducing the quality of service, lowering standards of education and relaxing the laws governing qualifications and licensure of practitioners would be simply playing into the hands of Charlatans and incompetents and worse, and cannot be justified on grounds of temporary necessity or expediency.

Temporary expedients may sometimes be necessary to meet present emergencies, but let us not forget that such expedients should be temporary; let us not be beguiled into believing that a temporary change in direction should take the place of our permanent, long-range course. This applies not only to the professions. Every citizen of this Republic should recognize this principle, for the problems of the professions are essentially the problems of America. We all belong to one Commonwealth which has prospered and grown strong under the "American way of life." It is a prime duty of those of us at home to see to it that temporary expedients are abandoned when the emergency is past and that the soldiers come back to the kind of America for which they are fighting.



President, Minnesota State Medical Association

Editorial

Carl B. Drake, M.D., *Editor;* George Earl, M.D., Henry L. Ulrich, M.D., *Associate Editors*

THE DIAGNOSIS OF MULTIPLE MYELOMATA

THE age decades in which myelomata occur are the same in which benign progressive degenerates manifest themselves. The similarity of symptoms are periodic pains in the back, pains in the pelvic or shoulder girdles, the different anemias, and albuminurias. The marked disproportion of degenerative cases, as compared with the number of myelomata, and their mimicry, no doubt lulls to sleep the awareness of this condition in our daily routine.

Geschickter and Copeland's[1] classical paper marks the era which might be designated as the anatomical-pathological study period of the disease. It covers an interim of nearly eighty years (1845-1928) and includes 425 cases. Their criteria for diagnosis are: (1) "multiple involvement of skeletal trunk of adults"; (2) "pathological fracture of a rib"; (3) "the excretion of Bence Jones bodies"; (4) "characteristic backache with signs of early paraplegia"; (5) "an otherwise inexplicable anemia"; (6) "chronic nephritis with nitrogen retention and low blood pressure."

These "taken in pairs or triads or collectively as a group" should make one aware of myelomata. There is a residue of cases, however, in which some finding or factors appear which are misleading. A recent case with a spontaneous fracture of the fourth lumbar vertebra with paraplegia, and a fractured rib (x-ray) certainly suggested myelomata. There was, however, an anomalous kidney finding (pyelogram) and the opinion turned to hypernephroma with bone metastases. At postmortem a diagnosis of myelomata was made. Again, a case was observed for twenty-four years. Painful hands, secondary anemias, albuminurias, gastro-intestinal symptoms, et cetera, recurred again and again. This patient had a complete skeletal review by x-ray three months before death. Atherosclerosis, lead poisoning, peri-arteritis nodosum, were considered and rejected. At postmortem, myelomatous infiltrations of the ribs were demonstrated. One wonders if the disease lasted twenty-four years or merely was a terminal event in the life of a septuagenarian. In both these cases, no test was made for Bence Jones bodies. Geschickter estimates these bodies are found in 65 per cent of myelomata. The impression is growing that their presence is more prevalent than that figure. It may be said that some time during the disease these bodies are present if persistently and correctly looked for. In the original test, nitric acid is used and not acetic acid to acidulate the urine. Not long ago, in trying to establish the presence of myelomata, the correct diagnosis was made by sternal puncture. Rechecking the urine for Bence Jones bodies, with nitric acid, they were found; whereas before, with acetic acid, the test proved negative.

Following the anatomical-pathological period, students of this disease made chemical studies of the blood to establish a differential method of diagnosing myelomata from invasive tumors of the bones and blood dyscrasias. Bence Jones bodies are occasionally found in these conditions also. Calcium, phosphorous, phosphatase, protein levels were established. Even iso-agglutinins and rouleaux formations were noted. These studies revealed variations of these findings in different lesions. In myelomata however, phosphatase, is not, or is only slightly, increased. This stage of the study of myelomata may be considered as the chemical period.

Now, a third period is under way. It is the use of the sternal puncture. The myelogram[2] may become almost as common as the hemogram. It is too early to say what this technique in the study of bone tumors will establish. However, the meager reports are most encouraging. The sternum is an early site for myelomatous nodes. Even if one is not lucky enough to puncture a node, the variation in the myelogram (increase of plasma cells) may put us on our guard.

With the prevalence of x-ray examinations and blood chemical studies, it is still pertinent to call attention to the simple test for Bence

Jones bodies in establishing the presence of bone destruction. Geschickter's criteria are invaluable. Chemical studies of the blood are worth while. Sternal puncture is promising. The test for Bence Jones bodies in the urine, which requires a minimum of apparatus, is still the most directive means we have in the diagnosis of multiple myelomata. H.L.U.

Bibliography

1. Geschickter and Copeland: Arch. Surg. 16:807-867, (April) 1928.
2. Piney: Sternal Puncture. p. 37. London: Wm. Heineman, 1941.

THE RED CROSS

IT was at the battle of Solferino in 1859 in the war between Napoleon III and Austria waged to liberate Italy and to annex Savoy and Nice to France that a Swiss by the name of Henri Dunant was a spectator. Being present and observing one of the bloodiest battles in history, Dunant was impressed with the need of a neutral organization whose function should be to mitigate as much as possible the suffering and unnecessary loss of life incident to war. He wrote "A Memory of Solferino" in which he described his experiences and as a result of his pioneering activities the first International Red Cross Congress was held in Geneva in 1863.

The American, Clara Barton, was in Berne, Switzerland, in 1870 at the outbreak of the Franco-Prussian War and joined the German Red Cross. On her return to the United States she devoted her energies toward persuading her countrymen to take part in this international humanitarian organization. After nine years of devoted effort our country ratified the Geneva Convention and we became the thirty-second nation to join.

The Red Cross has made a remarkable record in growth and usefulness since its foundation. While organized primarily for activity during war, its peacetime function at times of disaster is well known.

Nursing service in military hospitals has been one of the outstanding activities of the Red Cross and the Red Cross Nurse has been lauded in song and verse. One of the newer activities of the organization is the supervision of the Blood Donor Service, one of the more important innovations in the care of the wounded. In addition, the Red Cross has organized the nurses' assistants, the Gray Ladies, supervises the hospital recreation programs and service men's clubs overseas and maintains representatives at Army and Navy posts. In its home service work it assists the dependents of our fighting men. It must be prepared, too, to come to the rescue with trained personnel in case of disaster on the home front.

March has been declared Red Cross Month by our president. The usual roll call held in November was postponed from last November to March. This month a nationwide drive to raise a War Fund is being conducted in conjunction with the annual roll call. Only one appeal for funds this year is anticipated. A generous response is expected.

CAPITALISM DESIRABLE

SOMEHOW we have little fear of communism taking hold in our country. No communistic form of government has ever been successful. When put to the test in Russia, it resulted in the control of the government by a few who held their power through a system of force and terrorism just as undesirable as the Czarist régime. The fine showing of Russian defense must be attributed to the love of the Russian for his homeland rather than to the type of government.

Neither is a purely socialistic form of government with the elimination of capitalism ever likely to meet the approval of American citizens. The socialistic party in Germany met the same fate as communism in Russia, with the usurpation of power by a few brigands led by a psychopath which promises to result in the destruction of the country as well as the rest of Europe.

The elimination of capitalism will never meet with the approval of employer or labor unions. It is safe to say that as long as the majority of citizens in any country have private possessions to lose, there is no danger of revolution either violent or peaceful. Following 1929 the terms "capitalist" and "capitalism" were frequently referred to in a disparaging manner. Capitalism was blamed for the crash of 1929 and was considered by some a failure. Only shallow thinking fails to realize that any business enterprise requires savings or capital for its initiation. Anyone with a few hundred dollars saved is, strictly speaking, a capitalist. It takes savings and capital to make jobs and it is high time the approbrium be removed from the word "capitalist." It is the capitalistic form of social order which has

been the driving force that has made living in America better than in any other country.

The ambitious American who wants to accomplish things in a big way will want to continue our capitalistic form of society. Thinking leaders of unions know there would be no arguing with a socialistic government and, therefore, it is safe to assume that the majority of laboring men will never favor an entirely socialistic form of government.

Is there any reason to believe, if socialism in general will not be acceptable to the American citizen, that socialized American medicine will?

Socialized medicine abroad has been studied and most of the forms in use would not be acceptable to the American citizen. We are experiencing right now in this country a proof that the American citizen when he is able prefers to choose his own physician and hospital and pay for the service.

The all-inclusive British plan introduced in England by Sir William Beveridge will doubtless have its repercussions in this country. It is more than likely that a determined effort will be made to foist some such plan on our citizens on the grounds of war necessity.

Medical care in our country already has been socialized to a considerable extent. There are already as many hospital beds supported by government agencies as private. As a result of the war there is evidence of a tendency to increase rather than diminish the socialization of medicine. With the excuse of war emergency there is no telling what utopian plans may be suggested before the war is over. And after the war, what will be our economic status? It will require capital to provide new jobs for returning soldiers and high taxes will have to persist to pay interest on the already huge national debt. If the government is forced to supply the needed capital to furnish these new jobs, the transition from capitalism to socialism may be a simple matter. It will require a financial wizard in Washington to bridge the gap from war to peace economy.

For the medical profession to complacently sit back and oppose all change would be a mistake. To fail to resist complete socialization of medicine would be a betrayal of the American people. The profession should be and will be open minded in furthering plans proposed for the improvement of medical care at costs within reach of the public. The profession, as well as the public, are vitally interested in the preservation of capitalism, sometimes called the American way of life. Results of the recent elections indicate a reaction to the socialistic trends in our national government. A healthy state of affairs in the business world following the war will obviate any need for completely socializing medicine in America.

AGGLUTININS AID DIAGNOSIS

Discovery of substances in the blood, called cold agglutinins, that may help to segregate some of the cases of atypical pneumonia prevalent these days is announced by Dr. Oster L. Peterson, Dr. Thomas Hale Ham and Dr. Maxwell Finland, of Harvard Medical School and Boston City Hospital (*Science,* February 12).

These now prevalent kinds of pneumonia are generally called atypical pneumonia, because the disease is different from the pneumonia caused by the pneumococcus germ and is not caused by any known pneumococcus. Some cases may be caused by a virus. Until germs causing the atypical pneumonias are definitely known, the development of the cold agglutinins in the patient's blood may, the Harvard scientists suggest, serve as a criterion for segregating them.

Cold agglutinins, or autohemagglutinins as they are also called, develop very rarely in ordinary pneumonia and have been observed in a few patients with liver or blood diseases. The word cold describes the temperature at which the agglutinins act and does not refer to the common cold. The only infectious disease besides atypical pneumonia in which they have been found regularly is African sleeping sickness, known medically as trypanosomiasis.—*Science News Letter,* February 27, 1943.



MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

ACTION IN CHICAGO

Medical society officials all over the country are now awake to the fact that the old, comfortable, laissez-faire policy, punctuated by occasional routine blasts at the evils of state medicine, will no longer serve to protect American medicine. Nor will it keep pace with adjustments demanded by the changing times.

Evidence of this awakening was ample at the Chicago meeting of the National Conference on Medical Service, held at the Palmer House, Sunday, February 14.

It is interesting to note that Dr. W. L. Burnap of Fergus Falls was Secretary in charge of the program for the Conference and was elected President for 1944. Some thirty-five officers and members of the Minnesota State Medical Association attended the meeting.

Unforseen and almost unimagined difficulties were confronting all of the men who met there that Sunday.

They were all of them exerting every effort, out of limited supplies of physicians, to meet Army and Navy needs for medical officers. They had all been forced to decide among their colleagues who was essential and who was not to the medical service of the people at home. They were confronted with unprecedented demands, in the name of the war emergency, to let down the bars against physicians of doubtful education and background. They were face to face with a grave threat to medical education by the virtual assumption of control by the Army over the medical schools. Before them for immediate consideration were many proposals for expansion of the social security act to cover medical and hospital services. Some were engaged in prepaid medical service plans of their own. These plans were designed to meet and forestall the threat of government medicine but, so far, none had been conspicuously successful either as a public service or as a business venture. All were aware of the gradual encroachment from many avenues upon what once was the sphere of the private practitioner.

Behind the excellent formal program was the intent of its sponsors to focus and give expression to a feeling that obviously animated all of them—a feeling that the time for pronunciamentos is over and the time for concerted action is here.

This feeling resulted in unanimous passage of the following resolution for presentation to the Board of Trustees of the American Medical Association and to the House of Delegates of the Association next spring.

Resolution

WHEREAS social and economic changes have altered the lives of our citizens, and the Federal Government has found it necessary to issue directives from time to time, we as physicians believe that it is our duty to take a more active part in the creation of such regulations as affect the practice of medicine.

THEREFORE, BE IT RESOLVED, that this National Conference on Medical Service go on record as favoring the immediate development of a stronger national economic and legislative policy governing the practice of medicine and that such a policy be integrated with each state and county.

BE IT FURTHER RESOLVED that the expression of this National Conference on Medical Service be submitted to the Board of Trustees of the American Medical Association, advising them that this resolution, or a similar one, will be submitted to the delegates of the American Medical Association at their next annual meeting.

New Policies

As a result, it is hoped, an era of realistic, practical public policy will eventually replace the inaction of the past, a policy which will take into account, on the one hand, expanding conceptions of social security and on the other, the necessity for immediate steps to guide all legis-

lation and regulation impinging upon health and the medical care of the people.

History is made, these days, by directives from a bureaucrat's pen. It is only the part of wisdom and common sense that alert, forward-looking representatives of the medical profession should be at hand and in a position to offer counsel before, not after, such orders are signed and the regulations circulated.

That sort of coöperation with government agencies is not obstructive. On the contrary it represents the best type of constructive assistance which medicine can offer for the preservation of its own standards and for extension of the best possible service to all the sick.

NEW JERSEY PLAN

The Medical-Surgical Plan launched by the Medical Society of New Jersey in July, 1942, is unique in one respect.

It renders both medical and surgical care to subscribers and dependents while they are in the hospital. Thus it retains the protective feature of limiting service to the period of hospitalization and, at the same time, comes closer, in the opinion of many professional, lay and actuarial authorities, to filling the qualifications for a successfully prepaid insurance plan than do most of its contemporaries.

It coöperates closely with the Hospital Service Plan of New Jersey and has had the interest and support of many lay agencies and officials.

Members of employed groups with their dependents are eligible to participate in benefits. Premiums and requirements are simple. For single persons the service costs 75 cents a month; for subscribers with dependents, $2.00. Payment for maternity care and tonsillectomies is not allowed in the first eleven months of the first contract year. Otherwise, virtually all bills which involve hospitalization are eligible for payment.

Says Dr. Norman M. Scott, medical director and secretary of the New Jersey Society, in a recent issue of the New Jersey Journal: "Looming before us even now is the possibility of an almost unbelievable social and economic upheaval which will vitally affect the medical profession during the reconstruction period . . . .

"If such changes do come about and the medical profession is to become adjusted to them to the best advantage of our people, the profession and the practice of medicine we must first have common understanding of the problem and the united will to accomplish the adjustment. But this, alone, will not be sufficient, even though the profession be motivated by the highest purpose. For without proper technical and administrative knowledge and without an administrative agency through which we may accomplish the necessary adjustment our effort may fail. To become such an agency, to serve the profession in such a capacity is the highest purpose of a voluntary medical service corporation."

IN THE HOPPER

Signs of the times in Washington: A vocational rehabilitation bill has been introduced by Senator LaFollette of Wisconsin in the Senate and by Representative Barden of North Carolina in the House of Representatives. The bill provides for re-education and physical restoration and repair for veterans disabled in the present war, for civilian defense workers and for any other individual over the age of 16 who is disabled by reason of any physical defect or infirmity, whether congenital or acquired by accident, injury or disease. Creation of a rehabilitation service under management of a Director of rehabilitation would be created in the Federal Social Security Agency and funds would be allotted for the purpose to states presenting plans approved by the Federal Social Security Administrator. Full cost of rehabilitation for veterans would, of course, be assumed by the Federal Government. For others, the states would contribute one third.

For Extending Social Security

Six bills have already been introduced in the House and two in the Senate calling for expansions of various sorts in the Social Security Act. Provisions for disability benefits and for rehabilitaation to beneficiaries figure in several of them; but the bill introduced in the Senate by Senator Green of Rhode Island probably includes most of the items known to have the approval of the Social Security Board. It calls for extension of coverage in old age and survivor's insurance, for benefits to totally and permanently disabled workers, together with needed medical, surgical, institutional and rehabilitation services. Also for hospitalization benefits and federal aid to states for public assistance. Hos-

pitalization benefits would be not less than $3.00 a day nor more than $6.00, to be determined by the Social Security Board and to be available in institutions accredited by the Board.

Senator Wiley of Wisconsin, on the other hand, has proposed to establish a joint committee to be composed of members of the Senate Finance Committee and the House Committee on Ways and Means for the purpose of studying the need for and advisability of modifications or enlargements of the social security program and for consideration of proposals submitted to Congress therewith.

"Medical Services" of the Surgeon General

The bill for reorganization of the United States Public Health Service first proposed at the request of the Federal Security Agency in the last session has been reintroduced by Senator Thomas in the Senate and by Representative Bulwinkle in the House. By this reorganization, all functions of the public health service would be assigned to the office of the Surgeon General, to the National Institute of Health and to two bureaus, one of which would be a Bureau of Medical Services and the other a Bureau of State Services.

Obviously, a bureau on medical services within the United States Public Health Services marks a departure in policies and functions of that service. Even though the medical services provided may be definitely limited at the present time, the structure will be set up and ready to function if and as federal services expand to include care of the sick.

Cancer Clinics

In this connection, it is significant that a bill has just been introduced in the House by Representative Rogers of Massachusetts to authorize a federal appropriation enabling the United States Public Health Service to assist states, counties, cities or other political subdivisions to extend and improve measures through public and private institutions and organizations for the diagnosis, treatment and control of cancer. The bill contemplates establishment of hospitals, diagnostic, clinical and other facilities for the diagnosis and treatment of persons suffering from cancer. Funds would be allotted to states in the same manner as in plans for control of cancer under the Act of 1937, with approval of the Surgeon General.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. Dubois, M.D., Secretary

United States District Court Enjoins Interstate Shipment of Abortifacient Paste Manufactured by White Bear Lake Concern

Re United States of America v. Anne M. Jenks, doing business as Dependon Products and Jenks Physicians' Supplies.

On January 19, 1943, the Honorable Robert C. Bell, United States District Judge for the District of Minnesota signed an order granting a permanent injunction enjoining the shipment in interstate commerce of a drug labeled "Intrauterine Paste" or "Dependon Products Paste" manufactured and sold by Anne M. Jenks and Jenks Physicians' Supplies, White Bear Lake, Minnesota. The injunction followed a trial that commenced on January 5, 1943, at St. Paul, Minnesota. At the trial the Government called forty-six witnesses, thirty-nine of whom were physicians. Of this number six were confessed criminal abortionists and a dozen or more were physicians who had used the paste in so-called therapeutic abortions. A number of the witnesses gave expert testimony on the results that followed the use of this paste. Among the outstanding witnesses for the Government were: Dr. Anton J. Carlson, Professor Emeritus, and former Chairman of the Department of Physiology, University of Chicago; Dr. John L. McKelvey, head of the Department of Obstetrics and Gynecology, University of Minnesota; Dr. John W. Harris, head of the Department of Obstetrics and Gynecology, University of Wisconsin, and Dr. Ernest Grafenberg, obstetrician and gynecologist, New York City. The testimony of these witnesses presented a strong case that the paste is unsafe and dangerous to health.

The Court, in its findings of fact, found that the paste as shipped in interstate commerce was "composed mainly of potassium soap or other soft soap base, with small quantities of alcohol, iodine and distilled water added * * *." The Court also found that the paste was represented to the medical profession and others as being "safe and appropriate for introduction into the pregnant uterus, for the purpose of inducing labor, terminating pregnancy, and removing the retained portions of the products of conception." The Court also found that the paste was represented as "an effective medicament for the treatment of cervicitis, endometritis, dysmenorrhea, and cervical and uterine discharges." As a result of the evidence, the Court found that the paste "is unsafe and dangerous to health and has caused fatalities and serious injury. Among the specific dangers which are involved in and have resulted from its use are the extensive destruction of tissue, hemolysis or the destruction of the cellular portions of the blood, systemic potassium poisoning, extensive hemorrhage and prolonged bleeding, sterility, peritonitis, pulmonary embolism, damage to kidneys, liver and other internal organs, and increased susceptibility to infection." The Court then found as a matter of law that the paste was misbranded and that its labeling was false and misleading and that "in truth and in fact it is ineffective for such purposes." (Referring to the treatment of the conditions above enumerated.)

The Government was represented at the trial by Victor E. Anderson, United States Attorney, and Stanley V. Jacobson, Assistant United States Attorney, Mr. Jacobson doing the actual trial work. The preliminary investigation was conducted under the direction of J. O. Clarke, Chief, Central District Food

and Drug Administration, Chicago, Ill., assisted by the inspectors at the various stations throughout the United States, these men interviewing the various users of this paste. Dr. Ralph W. Weilerstein, Medical Officer, Food and Drug Administration, Washington, D. C., and Joseph L. Maguire, attorney, Office of the General Counsel, Federal Security Agency, Washington, D. C., assisted in the interviewing of medical witnesses and the legal preparation of the case for trial. Both Dr. Weilerstein and Mr. Maguire were present throughout the trial.

The Minnesota State Board of Medical Examiners wishes to commend the Government and the various governmental officers who handled the case. Many months were spent in preparing the case for trial. The success attained is a tribute to the careful preparation of the case and the superb manner in which Mr. Jacobson did the actual trial work. The defendant was represented by able counsel, but at the conclusion of the Government's case, the defendant offered no evidence and agreed that a permanent injunction should be entered on the basis of the Government's evidence.

The Minnesota State Board of Medical Examiners wishes to caution all of the members of the medical profession of this State against the use of this, or any other similar paste. Various articles have appeared in the *Journal of the American Medical Association* and elsewhere pointing out the dangers that arise from the use of an abortifacient paste. Certainly, a physician who uses such a paste, after all the warnings that have appeared, subjects himself to a grave responsibility in his relationship to the patient. While it is true that the paste was undoubtedly used by some physicians in therapeutic abortions, it is also a fact that the product was used by persons engaged in the performing of criminal abortions.

* * *

Minneapolis Woman Sentenced For Obtaining Morphine By Fraud And Deceit

Re State of Minnesota vs. Kathrine Rosenow, alias Kathrine Burkhardt, alias Kathrine Mahoney, alias Kathrine Fairchilds, alias Mrs. A. R. Fairchilds, alias Mrs. Johnson, alias Mrs. Peter Barnes, alias Mrs. Peter Varnes, alias Katherine Berg, alias Mrs. H. Peschkie.

On December 18, 1942, Mrs. Kathrine Rosenow, 2905 Irving Avenue South, Minneapolis, forty-one years of age, was sentenced by the Hon. Frank E. Reed, Judge of the District Court of Hennepin County, to an indeterminate term in the Women's Reformatory at Shakopee. Mrs. Rosenow had pleaded guilty on November 25, 1942, to an information charging her with obtaining morphine by fraud, deceit, misrepresentation and subterfuge. Mrs. Rosenow also pleaded guilty to three prior convictions of felonies for a similar offense, and is subject to a maximum sentence of life imprisonment under the laws of Minnesota. Judge Reed stayed the sentence pending the further order of the Court, and three days later, on December 21, 1942, Mrs. Rosenow was adjudged an inebriate by the Probate Court of Hennepin County, and ordered committed to the Willmar State Hospital for treatment for her drug addiction.

Mrs. Rosenow has a long record of drug addiction and numerous convictions arising out of that condition, in addition to the four felony convictions. In the present case the defendant obtained a prescription for morphine from a Minneapolis physician under a false name. The case was investigated by the Federal Bureau of Narcotics and an agent of that Department signed a complaint against the defendant. Mrs. Rosenow has gone from one physician to another in Minneapolis in her attempts to obtain morphine. Some physicians prescribed it for her and others refused. The medical profession should absolutely refuse to prescribe or dispense any of the derivatives of opium to a patient such as Mrs. Rosenow. Her prime purpose in securing morphine is to satisfy her drug addiction, and it is a criminal offense to furnish any of the derivatives of opium to a patient for such a purpose. Under the law, Mrs. Rosenow will be confined at the Willmar State Hospital until the Superintendent of that institution is of the opinion that she may be discharged. Her case will then be taken up in the District Court of Hennepin County for further proceedings under the sentence imposed by Judge Reed.

RED BLOOD CELLS SALVAGED

Red blood cells, formerly a waste by-product in the preparation of blood plasma, are now being salvaged. A saline solution of the red cells from blood collected by the Red Cross for the armed forces is being distributed in Detroit to eight Wayne County hospitals, to supplement direct transfusions or use of blood in "banks."

Detroit, among the thirty-one blood donor centers of the Red Cross in the United States, is the first to use the red blood cells, according to Dr. Warren B. Cooksey, technical supervisor of the Detroit center. While the thirty-one Red Cross blood donor centers have provided more than 1,500 000 pints of blood plasma for the treatment of armed forces and others, a paradox in the situation has been that, except on a very small scale, the red cells have been separated from the plasma and thrown away, although it is these cells, traveling in millions in the blood, which distribute to all tissues the oxygen they require.

The function of blood plasma, administered to patients, is to restore volume to the circulatory system. Without this volume the remaining blood cells and those being manufactured in the bone marrow cannot circulate.

Blood plasma is prepared for preservation over long periods. No means have been discovered for preserving and shipping red cells in the same manner, but when these cells are put in some favorable solution they can be used within one week after the blood has been drawn from a donor.

Three months ago the Detroit center undertook the preparation of this solution, saving all red cells instead of treating them as waste, and less than a month ago delivery of the solution was undertaken to nearby hospitals.

"This means that the blood banks in these hospitals may be tremendously supplemented," Dr. Cooksey said. "In any general hospital from 50 per cent to 60 per cent of patients needing new blood, either by direct transfusion or from the blood bank, are clearly cases in which the red cell solution serves just as well as the transfusion of bank blood. All red cell solutions are typed, as in direct transfusion blood or that preserved in blood banks.

"Red cells are universally needed in anemia cases. In cases of shock, only blood plasma is needed, for in shock, plasma, the fluid element of the blood, is rapidly absorbed by the body tissues. Use of the red cell solution has proved to be a remarkable aid in the treatment of various types of anemia."—*Science News Letter*, February 27, 1943.

INDUSTRIAL HEALTH

Edited by the Committee on Industrial Health and Occupational Diseases

A. E. Wilcox, Minneapolis, Chairman

H. B. Allen, Austin
L. S. Arling, Minneapolis
Martin Aune, Minneapolis
Richard Bardon, Duluth
P. H. Bennion, Saint Paul
R. B. Bray, Biwabik
R. P. Caron, Minneapolis
T. H. Dickson, Saint Paul
T. A. Lowe, South Saint Paul
J. L. McLeod, Grand Rapids
C. M. Smith, Duluth
H. G. Wood, Rochester

INDUSTRIAL ABSENTEEISM

Recently we have heard a great deal of the problem of industrial absenteeism—of which one of the greatest causes is sickness. The significance of the problem is illustrated by a bit of homely verse from Poor Richard's Almanac:

> "For the want of a nail, a shoe was lost,
> For want of a shoe, a horse was lost,
> For want of a horse, a rider was lost,
> For want of a rider, an army was lost,
> For want of an army, a battle was lost,
> For want of a battle, a kingdom was lost,
> All for the loss of a ten penny nail."

The man—and—machine power of this country is the ten penny nail in today's drama of war. If our productive capacity does not deliver the goods for the United Nation's battle, the poem may read: "For want of a battle, a free world was lost."

Wiley Saboteurs

All the delays from supply shortages, bottlenecks, labor troubles and sabotage combined will scarcely total in a year the destructive power of our wiliest saboteurs—disease and injury—which operate night and day in every plant in the nation. On an average of 400 million days are marked off every year due to these causes.

Bringing that astronomical figure down to earth, if *all* disabling sickness and accidents struck tomorrow in our war industries, we would cease production for the next 66 days.

It is difficult to overemphasize the seriousness of a report that in a recent month 8.5 per cent of the available labor time in a large copper mine was lost due to absenteeism.

In War Industries

There is no statistical information available to indicate the general extent of absenteeism in the war industries. Scattered reports from a number of factories reflect rates ranging from between 2 and 3 per cent up to 15 per cent and more. There also are no exact figures as to what part of this time lost is voluntary and what part is unavoidable. In certain industries in which there are extensive medical programs and close absence-control programs, it generally has not been possible to reduce absenteeism below 2 to 3 per cent. Some such level may perhaps be taken as a practical minimum and everything over this regarded as probably preventable and so, in a sense, voluntary. These national figures are quite high compared with individual plant experiences in this State.

Monday Absentees

Industrial absenteeism follows a rather marked pattern related to certain days of the week, suggesting a considerable voluntary factor. In general, absences are less frequent on paydays and quite high following payday. Moreover, there is a tendency for absences to be numerous on days adjacent to a week end or holidays. As an interesting example of this, in a certain plant over a period of several weeks, the absence rate on Friday paydays was about 4 per cent and on Mondays following payday almost 11 per cent.

There are, however, definite factors during a war effort which increase sickness and unavoidable lost time. As working hours are increased to the limit, the worker is under increasing nervous and physical strain. If the limit of his endurance is approached, time off the job in which to recuperate becomes a physiological necessity.

As the demands for labor become more acute, less nearly perfect physical specimens must be employed. More women and older employes, who have higher sickness rates, must be added to the payrolls.

In further analysis of the causes of industrial absenteeism, it has been shown in studies conducted by the American College of Surgeons that nonindustrial illness and injuries cause fifteen times as much lost time as industrial accidents. This indicates that more effort should

be devoted to reducing these causes, but does not indicate that we should let down on efforts to reduce industrial accidents. It has been estimated that illness costs labor and industry 5 billion dollars annually, and that accidents cost another 5 billion dollars.

Common Cold Leads

The common cold is still the leading cause of illness among industrial workers, accounting for about 43 per cent of lost time due to illness. The cost of the cold to the worker, calculated on salaries lost at $4 per day is about 150 million dollars annually. With added medical costs, this is about 250 million dollars per year.

The question then arises: How much of this illness is preventable? The U. S. Public Health Service and the Subcommittee on Industrial Health and Medicine says 20 per cent. The experience of 2,064 plans in the National Association of Manufacturers shows that by a proper industrial health program the application of preventive medicine, industrial absenteeism can be reduced 29.7 per cent. This means then that at least 80 million man days can be saved annually, or time enough to build 14,000 bombers, 10 dreadnaughts, or 33,000 tanks.

Such an industrial health program requires close coöperation between employers, employes, governmental health and labor agencies, and organized labor; and also between such professional groups as physicians, dentists, nurses, industrial engineers, chemists, and statisticians.

Must Protect Himself

The individual must be led to realize that to a large extent he must protect himself against disease by his own conduct, such as by securing adequate rest, proper recreation, and adequate nutrition. He should on first sign of illness consult with the medical department and should have periodic physical examinations to detect early signs of oncoming disability before it becomes chronic and incapacitating. Industrial dermatitis, one of the most bothersome of occupational diseases, can largely be prevented by careful cleansing of the skin, using proper skin cleansers. Personal protective devices such as respirators, protective clothing, and goggles, should be worn when they are provided. Finally, all workers should contribute their part in the maintenance of good plant housekeeping.

—L. W. Foker.

WOMAN'S AUXILIARY

Mrs. Raymond J. Josewski, *President*
Stillwater, Minnesota
Mrs. W. H. Rucker, *Publicity Chairman*
Minneapolis, Minnesota

St. Louis County

Mrs. W. N. Graves of Duluth was hostess to the St. Louis Medical Auxiliary on February 9 at a Valentine Bridge Party.

Goodhue County

Mrs. R. J. Josewski was guest at the January meeting held at the home of Mrs. R. V. Sherman, State Public Relations Chairman. Mrs. Josewski spoke to the group on the various ways of being of service to the community.

A Course in Nutrition was started by Mrs. E. H. Jeurs, former Home Economics instructor. This course is to be continued as a regular part of each meeting for the remainder of the year.

Scott-Carver

In Memoriam

Cordelia Pond Wunder, who died in November, 1942, took an active interest in both the State Medical Auxiliary and the Auxiliary of Scott-Carver Counties when she lived in Shakopee.

Cordelia Pond was born in Shakopee, July 2, 1885, the daughter of E. Judson and Minnie Markus Pond, and granddaughter of Rev. Samuel Pond, the well-known pioneer Presbyterian missionary among the Indians in the early days of Minnesota history. She grew to young womanhood in Shakopee and after her graduation from high school took up the profession of nursing. She took her training at Abbott Hospital and later as technician at Swedish Hospital in Minneapolis and was employed in Minneapolis, Denver and at the state sanatorium at Cannon Falls, until 1927. That year she came as laboratory technician to Mudcura Sanitarium, there to meet and become the life partner of Dr. Henry E. Wunder, physician at Mudcura.

She was a member and held office in the Minnesota State Medical Auxiliary. Shortly after her marriage she became a member of the Booklovers' Club of Shakopee and has served as its president and its secretary. The members of the club in a body were present at the funeral.

Hennepin County

On February 5 the Hennepin County Auxiliary met in the medical lounge of the county society in the Medical Arts Building.

Two delightful books were reviewed by Mrs. Boardman. During the tea hour which followed Mrs. Angus Morrison, head of the Hennepin County Red Cross, appealed to the group for more help in making Red Cross dressings as the army and navy were tripling their demands.

Minnesota Academy of Medicine

Meeting of December 9, 1942

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, December 9, 1942. Dinner was served at 7 o'clock and the meeting was called to order at 8 o'clock by the President, Dr. Martin Nordland.

There were forty-five members and one guest present.

Minutes of the November meeting were read and approved.

The following officers were elected for 1943:

President—Dr. H. B. Zimmermann.....Saint Paul
Vice President.....Dr. Walter Camp, Minneapolis
Secretary-Treasurer..Dr. E. V. Kenefick (reëlected)

The scientific program followed.

Dr. H. E. Michelson, of Minneapolis, gave a lantern slide talk on Clinical Reports of Cases of Tuberculosis of the Skin.

INTENSIVE CHEMOTHERAPY IN EARLY SYPHILIS

FRANCIS W. LYNCH, M.D.
Saint Paul, Minnesota

Though the clinical features of syphilis had long been known there was no really effective form of treatment until 1910. Both iodides and mercury had been applied with a degree of success and other drugs were also in use but none of these measures adequately controlled the early infectious stage. Ehrlich's introduction of chemotherapy thus opened the modern era in treatment of this disease, and he and the profession hoped that he had achieved his goal of a "therapia magna sterilisans." The clinical results of treatment were soon reported by Wechselman who recognized that repeated injections of arsphenamine were necessary in most cases of early syphilis. Thus it became evident that Ehrlich had failed to develop a drug which might cure the disease in a single injection though clinical experience soon demonstrated that he had discovered a therapeutic agent far more effective than any known before. In those early years many syphilologists developed individual schemes of treatment of early syphilis but the "Pollitzer method" may be cited as a fairly characteristic example. On three consecutive days he administered 0.1 gm. of arsphenamine for every 25 pounds of body weight and followed this intensive treatment with a series of eight weekly injections of mercury salicylate. This and similar methods of "abortive cure" remained popular for several years although 1917 saw the introduction of alternating courses of arsenical and mercurial drugs for a continuous period of one year, a routine which was not greatly changed by the later general replacement of mercury by bismuth nor by the addition of mapharsen in 1933. The method was modified in details but the principle has remained and it now represents the "standard" form of chemotherapy of early syphilis which is applied according to a more or less fixed schedule.

The results of treatment by the standard method have been generally satisfactory though cure does not always follow. Failure usually results from unwillingness or inability of the patient to complete thee entire course of treatment. The cost and discomfort, but most of all the nuisance of weekly injections keep a majority of infected persons from obtaining full benefit from treatment. These incompletely treated patients form perhaps the most important source of transmission of this disease because infectious relapse so often develops in a patient who thinks he is cured, stops treatment, then unknowingly transmits the disease to others. With arsenic as with most of the effective therapeutic agents, toxic and unpleasant reactions are fairly common but a fatal outcome is relatively rare. It is thus clear that standard methods of treatment of early syphilis are not entirely satisfactory and one can understand the reason for continued attempts to develop a quick or "abortive" cure.

Modern intensive chemotherapy in early syphilis dates from the discovery that large amounts of fluid and large doses of drugs, antigens or antibodies can be administered safely if the rate of administration is sufficiently slow. Chargin, Leifer and Hyman applied this technique in the administration of neoarsphenamine to twenty-five patients with early syphilis, giving an average of 4.0 grams in four or five days. The results were sufficiently promising so that hospital and public health authorities gave support to application of the treatment to a larger series of patients. After eighty-six additional patients were treated with neoarsphenamine the group decided to substitute mapharsen because of its lesser toxicity. The daily dose was at first selected in proportion to that of neoarsphenamine but it was soon found that larger doses could be given safely. One hundred and fifty-seven patients were then treated with an average of 700 mg. of mapharsen, an amount now regarded as inadequate, after Chargin, Leifer and Hyman increased the dose to 1200 mg. given at the rate of 240 mg. on each of five consecutive days.

Toxic reactions were to be expected in a method of treatment combining rapidity of administration and large total dosage, but they have been few and most have not been severe. Nausea, vomiting, chills, high fever, nitritoid reactions and hepatic damage have been observed infrequently. Toxic cutaneous eruptions are seen but severe types of dermatitis have been extremely rare. Aplastic anemia and related dyscrasias have not been reported. On the other hand, the intensification of administration of arsenic has led to an increase in toxic

From the Division of Dermatology, University of Minnesota, Dr. H. E. Michelson, Director.

reactions in the nervous system, a tissue not often harmed by standard therapy. Severe neuritis was frequent in cases treated intensively with neoarsphenamine but the change to mapharsen largely eliminated this unpleasant complication. The principal source of discouragement with intensive therapy has been the too frequent development of severe toxic damage to the brain. Arsenical encephalopathy, formerly and usually incorrectly described as hemorrhagic encephalitis, accounts for almost all the reported fatal reactions to intensive therapy. In most cases this reaction gives little or no warning but manifests itself several days after stopping treatment. The development of headache during the treatment signifies that administration of the drug should be stopped and hypertonic solutions should be given. Sedation is also supposed to help patients who have toxic cerebral reactions; other treatment is of little avail. The original group of New York physicians reported their series conservatively and with specific comment that they regarded the study as experimental.[7]

In spite of toxic reactions, the reported results of intensive treatment were sufficiently encouraging so that other clinicians wished to extend the use of the method. From this desire there developed a coöperating group of Midwest Clinics who have worked with the assistance and supervision of the United States Public Health Service and the Health Departments of various states. Representatives of these clinics have met regularly to review the results of the work at each clinic and to discuss the problems arising in their experiences.

Since it would have been unwise as well as impractical for all to limit themselves to the dosage and technique of the original workers, many modifications have been suggested relating chiefly to differences in dosage and technique,[5] concurrent or subsequent use of bismuth,[3a] subjection of the patient to a second course of treatment or combination with fever therapy.[1,6] Treatment has also been administered to patients having later manifestations of syphilis, a field which lies outside the scope of this presentation.[3b]

Evaluation of the results of treatment of syphilis is always difficult because the nature of the disease requires that patients should be followed for a lifetime. It is even more difficult to compare the results from intensive therapy with those obtained by standard measures because of the frequent problem of reinfection in patients treated by intensive methods, easily confused with relapse or recurrence. In most reported cases it is impossible to meet the strictest criteria of definition of infection. Certainly, reinfections should not be classed as failures but the doubtful cases provide a group which it is impossible to classify to the satisfaction of both the proponents and opponents of intensive methods of treatment.[3c] Nevertheless, a summary of results is necessary and the figures can be accepted as nearly, if not entirely accurate.

Various observers have reported cures in 83 per cent of patients with early syphilis treated continuously for six to twelve months with standard therapeutic measures. Moore has stated his belief that 95 per cent of full coöperative patients can be cured "with the best available conventional methods of treatment," but it is obvious that most patients do not receive treatment which measures up to this standard. In comparison, experience indicates that at least 85 per cent of early cases can be cured by the "New York technique" of intensive therapy.[3d] If patients who fail to respond and those who have relapses are given the advantage of a second course of treatment the results can be considerably improved.

Results of Treatment at University Hospitals

At the University Hospitals treatment has been given only to patients with early syphilis and the standardized method of Chargin, Leifer and Hyman has been followed. Although the series of patients is not large, it may be of local interest to review the results.[4] All patients had early syphilis and were treated with the generous cöoperation and help of the Minnesota Department of Health. Included in the report are thirty-seven cases, eighteen of them men and nineteen women. The majority were between twenty and thirty years of age, eight being younger and five older than those limits. The course of treatment has usually been uneventful; twenty-five patients had no distressing reaction. Of the remainder, four had fever of more than 102 degrees but no other evidence of toxicity. One of these and one other patient developed "erythema of the ninth day," an eruption whose significance is not clear but which is also seen in patients treated by standard methods and is not regarded as evidence of major toxicity. One developed pain in the arm, probably vascular rather than neuritic in nature. Two had mild toxic eruptions of the type which does not go on to exfoliation and dermatitis.

All the reactions so far listed can be regarded as mild and of no consequence; similar reactions might be met with in a series of patients treated by standard methods. Unfortunately, it is necessary to add a record of two deaths, associated with signs and symptoms of cerebral involvement (arsenical encephalopathy). In neither case had there been any untoward incident during the course of treatment; the symptoms developed several days later and led rapidly to unconsciousness and death. Both patients were in excellent physical condition previous to acquiring their syphilis which had progressed to the stage of a generalized eruption when treatment was begun.

Two fatal reactions in a series of thirty-seven cases is extremely discouraging and no further consideration can be given so toxic a therapeutic modality, regardless of how good the results may have been in the thirty-five remaining patients, unless experience of others is more favorable. Reports from other clinics show that the local series is not a fair example of what may be expected with intensive treatment. A few fatal cases have been observed by others but the number is small and it is evident that the mortality rate with the "New York dosage" must be approximately 1 in 250 to 300. This mortality rate must first be balanced against the effects of the disease when untreated; from this viewpoint use of the method is fully justified. The mortality rate must also be compared with that of standard

methods of treatment and here one runs into major difficulty; one cannot give even a close approximation of the mortality rate for the standard treatment of syphilis. The clinician's memory is notoriously inaccurate when he is asked to recall from his experiences deaths resulting from treatment. Records are not satisfactory for many reasons, one being that death so often occurs in a different community or at least a different hospital and clinic from that where the offending treatment was administered.[3e] It can only be stated that the risk of death is greater with intensive than with the standard methods and that clinicians of experience disagree within wide limits as to the proportion of increased risk.

In reporting the results of treatment in the local series it is impossible to speak of "cure" because insufficient time has passed; results can only be classified as satisfactory from the standpoint of serologic reversal, maintenance of negativity and absence of clinical evidence of infectious relapse. Four of the thirty-seven cases were treated so recently that the last observation was made less than six months after completion of the course of treatment; they are excluded from consideration in this part of the report. Spinal fluid examination at the end of one year has demonstrated no positive reactions in twelve cases; one patient whose fluid was abnormal before treatment, later had a normal fluid. In the remaining cases the fluid has not yet been examined. No clinical evidence of relapse has been demonstrated in any case but not all have had the benefit of frequent and thorough examination.

Because most physicians in this community depend chiefly on results of the Kolmer test as performed by the laboratory of the Minnesota Department of Health, the result of this test has been regarded as the criterion of serologic status. In all cases numerous other tests have been performed including quantitative estimates in Dr. Kahn's laboratory at Ann Arbor. Of thirteen patients observed twelve or more months after treatment, eleven gave negative reactions to the Kolmer test (85 per cent). In the two remaining cases the reaction was positive but decreasing in titre according to Dr. Kahn's report;[3f] these two patients had generalized eruptions when treatment was started. Among eighteen cases where the last test was performed six to twelve months after treatment the Kolmer reaction was positive in two. Regarding as failures the two cases in each of these groups and the two having fatal reactions, the results of treatment were satisfactory in twenty-five of thirty-one cases (81 per cent). The favorable results in this small series are comparable with those in the composite report of the Midwest Group of Clinics.

Comment

I believe that almost all dermatologists agree that the present degree of success with intensive therapy of early syphilis completely justifies continuation and modification on an experimental basis searching for a less toxic but equally effective method. Most will agree with Wile's statement that the introduction of this form of treatment is a milestone in the development of antisyphilitic therapy.[3g]

Where is the future of intensive chemotherapy of early syphilis? The most promising modifications are administration of a second course of treatment in cases where a single course appears to have failed, the combination of less intensive arsenical therapy with concurrent or subsequent courses of bismuth or the concurrent administration of fever therapy. The two latter methods offer the advantage of decreasing the amount of arsenic and thus lessening the likelihood of toxic reaction. Even if changes in intensive therapeutic methods fail to bring the results we all hope for, the introduction of this method has served many advantageous purposes. It has attracted public attention to the important problem of controlling syphilis. It leads to hospitalization of patients in the most infectious stage of the disease, thus decreasing the likelihood of transmission of syphilis. It forces the patient to complete the desired course of treatment. Aside from the line of thought considered in this presentation there is the very considerable advantage that supporters of more conservative methods of treatment have been obliged to reëvaluate the results obtained with standard methods and have been stimulated to attempt to improve those methods.[2]

Summary

The modern methods of intensive chemotherapy in early syphilis have been discussed briefly with reference to the development of the technique, the results of treatment and the toxic reactions to be expected. Thirty-seven patients with early syphilis received intensive therapy at the University Hospitals; the results are reported. An apparently satisfactory result has been recorded in 81 per cent of the cases, a figure which compares with the reports of other clinics using similar methods (85 per cent). The incidence of fatal reaction was higher in the local series than it has been among patients treated elsewhere.

The advantages and disadvantages of intensive chemotherapy have been discussed briefly. Hope is expressed that a less toxic, more effective and equally rapid form of treatment may be developed.

References

1. Dattner, B., Thomas, E. W., and Wexler, G.: Cerebral reactions associated with massive mapharsen treatment of early syphilis. Am. Jour. Syph. Gon. and Vener. Dis., 26:529, 1942.
2. Eagle, H., and Hogan, R. B.: The intravenous drip and other intensive methods for the treatment of early syphilis. Science, 95:360, 1942.
3. Midwestern Discussion Group-Progress Reports on Massive Dose Therapy of Early Syphilis. Fifth Meeting, Indianapolis, July 16, 1942.
   (a) Cooper, G. A.: Multiple arsenical injections, bismuth concurrently.
   (b) Kaplan, B. J.: Extension of treatment plans to include other than "public health syphilis."
   (c) Shaffer, L. W.: Criteria of reinfection for intensive treatment cases.
   (d) Elliott, D. C., and Revell, L.: Reports of cases received to July 1, 1942.
   (e) Gonzales: Quoted by Hyman, H. T.
   (f) Kahn, R. L.: Observations with supersensitive serological tests.
   (g) Wile, U. J.: An epilogue of prognosis.
   (h) Rattner, H.: Pregnancies and observations on infants.
4. Nelson, L. M.: Massive arsenotherapy in syphilis by the continuous intravenous drip method. Staff Meeting Bull. Hospitals of University of Minn., 12:268, 1941.
5. Schoch, A. G., and Alexander, L. J.: Intensive arsenotherapy of early syphilis. Arch. Dermat. and Syphil., 46: 128, 1942.
6. Simpson, W. M., Kendell, H. W., and Rose, D.: Develop-

ments in the treatment of syphilis. Brit. Jour. Vener. Dis., 17:1, 1941.
7. Symposium: Massive arsenotherapy in early syphilis by continuous intravenous drip method. Arch. Dermat. and Syphil., 42:239-284, 1940.

Discussion

Dr. H. E. Michelson, Minneapolis: Dr. Lynch has given us a very good review of this new treatment of syphilis. He has not stated that we were advocates or opponents of the method, but merely pointed out the good and bad points. When one is confronted with a new treatment for syphilis, he must consider whether the treatment is a better type of treatment, whether it is safe, and, is it available? We have had no scarcity of drugs or methods in the treatment of syphilis. It has been largely a matter of how to employ the drugs offered. A biological treatment has not as yet been put forward. With any chemical, one must always consider the dosage, the dilution, the interval, and the total amount which may be given. In syphilis, it is important to realize that most patients are able either to overcome, or at least control, the infection without the aid of drugs. Therefore, one must always consider whether or not the treatment is interfering with the natural immunity process.

There is no question that the danger in this new treatment lies in the total amount of arsenic given to the patient in a very short length of time, and we feel certain that the same amount, spread over a much longer time, is not nearly as dangerous; therefore, the economic side of the question becomes important. It is hard to estimate whether it is advisable to concentrate a treatment, and thereby assume a big risk, or to spread the treatment out, with much less risk. All in all, Dr. Lynch has given you our view on the matter, and time alone will tell whether or not the treatment should be the one of choice for early syphilis.

Dr. H. Z. Giffin, Rochester: I am not sure whether 85 per cent of all patients who begin standard treatment are subsequently cured, or whether the figure is 85 per cent of those who complete treatment by standard methods. Will Dr. Lynch clarify this point?

Dr. H. B. Zimmermann, Saint Paul: Since bismuth apparently can be substituted effectively for part of the arsenic originally used in treatment and the latter is the more toxic drug, why cannot the substitution be complete and only the less toxic drug, bismuth, be used?

Dr. J. M. Armstrong, Saint Paul: When bismuth has been substituted or added to intensive arsenical therapy, in what form has it been administered?

Dr. Lynch, in closing: In reply to Dr. Giffin, the estimate of 85 per cent effectiveness with standard treatment measures is dependent on completion of the scheduled amount of treatment. Perhaps the majority of patients do not receive the desired amount of treatment and the incidence of cure is thus lowered considerably. One of the greatest advantages of intensive treatment methods lies in the fact that practically all the patients receive the desired amount of treatment.

Only in experimental animals has Tatum shown that metallic bismuth is therapeutically equal with arsenic in the same amounts; perhaps this is not true for humans. While Dr. Zimmermann's suggestion of complete substitution would lower the rate of reactions, bismuth works so much less rapidly that we would lose one of the chief advantages of intensive methods, the quick elimination of infectiousness. Bismuth and arsenic apparently do not work in the same manner in syphilis; probably the ideal treatment will use a combination of the two.

In reply to Dr. Armstrong's question, various workers have used the different forms of bismuth, aqueous solution, oily solution and suspension in oil. In experimental animals Tatum has shown that at least five of the standard forms of bismuth are equally effective.

The discussers have been kind enough not to ask why our mortality rate exceeds that of other clinics. I would like to offer two excuses, admitting that even they are not sufficient explanation. The series at the University Hospitals included no Negroes; they are notoriously tolerant of arsenical therapy and comprise large fractions of the groups treated by many clinics. The proportion of women in our series is also above that usually found in clinic practice and women are less tolerant of arsenical drugs. Another fair question would relate to the need for intravenous drip therapy. The drug may also be administered in divided doses given by syringe at intervals during the day.

To summarize my own opinions relating to intensive treatment measures: I hope for an improved and safer method which may be acceptable for universal use. In the meantime, I believe the present method is too dangerous for general application but I think its use is justified in certain instances, particularly when dealing with irresponsible or transient persons who are obviously unlikely to complete the full course of standard treatment. The increased risk is justified not only by the increased likelihood of cure of the individual but also, and probably more important, by reducing the period of infectiousness and thus preventing transmission of the disease to others.

The meeting adjourned.

E. V. Kenefick, M.D., *Secretary*

---

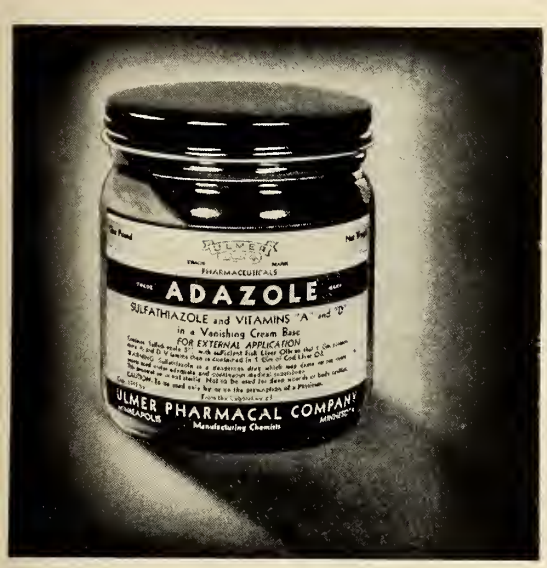
*Thanks to books the dead appear to me as though they still lived—everything decays and falls into dust by the force of time; Saturn is never weary of devouring his children and the glory of the world would be buried in oblivion had not God as a remedy conferred on mortal man the benefit of books. * * * Books are the masters that instruct us without rods or ferrules, without reprimands or anger, without the solemnity of the gown of the expense of lessons. Go to them, you will not find them asleep; if you err, no scoldings on their part; if you are ignorant, no mocking laughter.*—Quoted from Richard de Bury (Philobiblion, 1345) in a *Surgical Pilgrim's Progress* 1845-1925, Reminiscences of Lewis Stephen Pilcher.

TREATMENT OF CRANIOCEREBRAL INJURIES IN MODERN WARFARE

(Continued from Page 287)

rents in the dura with a large skull defect, and sometimes can be covered by osteoplastic structures or by certain metals, such as tantalum and vitallium. Celluloid plates have been used with fair success, but the inert metals are perhaps more desirable. The problem of the malingerer is always a factor in the treatment of any person who has received an injury, but fortunately it does not occur so often in the military field as it does in civil practice among members of the civilian population who have compensation insurance.

FOR *Professional use* ONLY



ADAZOLE

ULMER *Quality*

SULFATHIAZOLE CREAM (5%)

Fortified with Natural Cod Liver Oil Vitamins A and D

Extensive research has long indicated the importance of cod liver oil ointments in hastening the healing of damaged tissues. With the development of the sulfonamide drugs and their amazing accomplishments in controlling infection, it was a logical move to combine sulfathiazole with cod liver oil in a suitable cream base. The result is ADAZOLE (Ulmer), containing 5% SULFATHIAZOLE, in a stainless vanishing cream base, fortified with natural cod liver oil vitamins A and D.

ADAZOLE (Ulmer) is a pharmaceutical achievement and its acceptance is general with the medical profession. It is proving especially valuable in industrial work where loss of skin tissue and abrasion presents one of the greatest difficulties in caring for employes and is a frequent cause of prolonged disability. In the treatment of this type of wound the application of ADAZOLE (Ulmer) requires much less frequent change of dressings, helps to reduce infection and aids rapid healing without destruction of the new granulation tissue.

If you haven't already learned at first hand the value of ADAZOLE (Ulmer) in treating your patients, we suggest that you include a trial jar with your next order. Per pound.....$3.00.

Not Advertised to the Laity

Ulmer Pharmacal Company products are distributed by

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.
MINNEAPOLIS MINNESOTA

✦ Reports and Announcements ✦

MEDICAL BROADCAST FOR MARCH

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Saturday morning over Station WCCO, Minneapolis and Saint Paul, and at 11:30 o'clock over Station WLB, University of Minnesota. *Speaker:* William A. O'Brien, M.D., Director of Postgraduate Medical Education, Medical School, University of Minnesota.

March 6—Glaucoma
March 13—Cataract
March 20—Care of Eyes
March 27—Third Molars

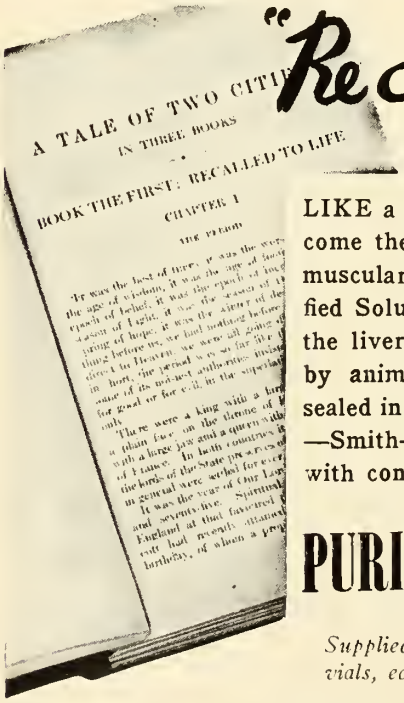
AMERICAN UROLOGICAL ASSOCIATION

The $500 Research Prize annually offered by the American Urological Association will not be awarded this year, according to an announcement received from Dr. Miley B. Wesson, chairman of the Committee on Research. As the Government has discouraged the holding of medical conventions, except those primarily of military interest, plans for the June meeting of the American Urological Association in St. Louis have been cancelled.

AMERICAN COLLEGE OF SURGEONS

The first session of a series of twenty war sessions of the American College of Surgeons to be given throughout the United States was held March 1 at the Lowry Hotel in Saint Paul.

Topics discussed relating to military medicine included care of the ill and injured in combat zones and after evacuation. The newer types of injuries encountered in this war, such as crush and blast injuries, were especially considered, together with prevention and treatment of infections, and treatment of burns, shock, and injuries of specific parts of the body. Anesthesia, plastic surgery, and the psychoneuroses of war also were discussed. Problems of civilian medical care in wartime, included the responsibilities of individual doctors and hospitals; personnel problems of hospitals; organization of emergency medical services; maintaining adequate supplies, furnishings, and equipment; maintenance of high standards of medical and nursing education, and of hospital service in general; hospital public relations; and administrative adjustments in professional staffs of hospitals. The opening meeting of the session was de-

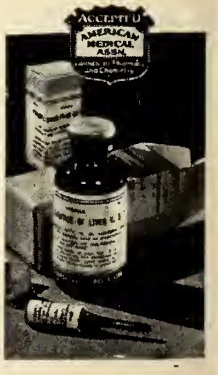


"Recalled to Life"

LIKE a call to renewed life for the pernicious anemia patient, come the latest developments in liver therapy. . . . For intramuscular injection, Smith-Dorsey has prepared a U. S. P. Purified Solution of Liver containing all the fraction G (Cohn) of the liver extract. Rigidly standardized . . . twice tested by animal injection to prevent local tissue reaction . . . sealed in ampoules and vials . . . finally tested for sterility —Smith-Dorsey offers a product to which physicians can turn with confidence.

PURIFIED SOLUTION of LIVER

Supplied in 1 c.c. ampoules and 10 c.c. and 30 c.c. ampoule vials, each containing 10 U.S.P. Injectable Units per c.c.



The Smith-Dorsey Company

LINCOLN ✦ NEBRASKA

Manufacturers of Pharmaceuticals to the Medical Profession since 1908

INTRODUCTORY OFFER

"OVA-ESTRIN"

(Estrogenic Extract)

10,000 International Units per c.c.

Manufactured by
HOSPITAL LIQUIDS CO.

Per 15 c. c. vial, $4.25

1 VIAL **FREE** WITH THE PURCHASE OF 2 VIALS.

On this basis your cost is 19c per c.c.

ENDO LIVER EXTRACT

(Injectable)

For intramuscular use.

Purified Solution of Liver U.S.P.

Each c.c. represents 10 injectable units.

10 c.c. Vial—100 U.S.P. Units

Only $2.75

For a limited time—One 10 c.c. Vial **FREE** with the purchase of 3 Vials.

Accepted by the
Council on Pharmacy & Chemistry of the A. M. A.

C. F. ANDERSON CO INC.

901 Marquette Avenue **ATlantic 3229** **Minneapolis, Minn.**

Write for Prices in Quantities

voted to discussion of "Medical and Surgical Aspects of Chemical Warfare," and the closing meeting was devoted to a panel discussion on problems in wartime civilian medical practice.

The American College of Surgeons cancelled its 1942 national meeting and is holding in abeyance plans for a Clinical Congress in 1943, in the meantime offering the regional meeting plan provided by the War Sessions to save the time of the doctors and other personnel, and to minimize transportation difficulties, without sacrificing unduly during wartime the educational and stimulative benefits of medical assemblies.

E. STARR JUDD LECTURE

Dr. Alfred Blalock of Baltimore, Maryland, Professor of Surgery at the Johns Hopkins Hospital, will give the tenth E. Starr Judd lecture at the University of Minnesota in the Museum of Natural History Auditorium on Thursday, March 11, 1943, at 8:15 p.m. The subject of Dr. Blalock's lecture is "Traumatic Shock with Particular Reference to War Injuries."

The late E. Starr Judd, an alumnus of the Medical School of the University of Minnesota, established this annual lectureship in surgery a few years before his death.

SIGMA XI LECTURES

First of three speakers sent out by the national organization of Sigma Xi, honor society in science, who are this year taking the place of the traditional University of Minnesota speakers, appeared on the campus, Wednesday, February 10. Dr. D. W. Bronk, director of the University of Pennsylvania's Institute of Neurology, spoke in the Medical Science Amphitheatre on "The Human Machine in Aerial Warfare." His talk was given under the joint auspices of the Minnesota chapter of Sigma Xi and the Medical School. He described the exceedingly delicate means of measuring changes in nerve cells whereby the body keeps itself in balance with its environment and went on to show how these balances and other body functions are upset at the heights to which modern airplanes fly. The human body is unable through normal means to make the rapid adjustments required in the nervous system and in the blood stream and science has had to step in, with special equipment, to fill the need.

The second lecture of the series will be given under the sponsorship of the society and the Physics Department of the University, Thursday, March 10, at 4:30 P.M. in room 150, Physics Building. G. D. Birkhoff, Perkins Professor of Mathematics of Harvard University, will speak on "The Mathematical Nature of Modern Physical Theories."

On Thursday, April 1, the third lecture will be given at 8:00 P.M. in the Chemistry Auditorium under the auspices of the society and the Minnesota chapter of the American Chemical Society. Dr. Peter Debye, Professor of Chemistry of Cornell University, will present the subject "The Magnetic Approach to Absolute Zero."

PROFESSIONAL PROTECTION

SINCE 1899
SPECIALIZED
SERVICE

In addition to our Professional Liability Policy for private practice we issue a special
MILITARY POLICY
to the profession in the Armed Forces at a
REDUCED PREMIUM

THE
MEDICAL PROTECTIVE COMPANY
OF
FORT WAYNE, INDIANA

Cook County
Graduate School of Medicine
(In Affiliation with Cook County Hospital)
Incorporated not for profit
ANNOUNCES CONTINUOUS COURSES

SURGERY—Two Weeks' Intensive Course in Surgical Technique starting March 8 and 22, April 5 and 19, and every two weeks throughout the year.

MEDICINE—Two Weeks' Intensive Course in Medicine starting June 7. One-month Course in Electrocardiography and Heart Disease starting the first of every month, except August.

FRACTURES & TRAUMATIC SURGERY—Two Weeks' Intensive Course starting April 5.

GYNECOLOGY—Two Weeks' Intensive Course starting April 5; Clinical and Diagnostic Courses.

OBSTETRICS—Two Weeks' Intensive Course starting April 19; Informal Course.

OPHTHALMOLOGY—Two Weeks' Intensive Course starting April 5.

OTOLARYNGOLOGY—Two Weeks' Intensive Course starting April 19.

ROENTGENOLOGY—Courses in X-ray Interpretation, Fluoroscopy, Deep X-ray Therapy every week.

UROLOGY—Two Weeks' Course and One-month Course available every two weeks.

CYSTOSCOPY—Ten-day Practical Course every two weeks.

General, Intensive and Special Courses in All Branches of Medicine, Surgery and the Specialties.

TEACHING FACULTY — ATTENDING STAFF OF COOK COUNTY HOSPITAL

Address: Registrar, 427 S. Honore St., Chicago, Ill.

REFRESHER COURSE

A refresher course in Laryngology, Rhinology and Otology will be given March 22 to 27, inclusive, 1943, at the University of Illinois College of Medicine. The course has been arranged to meet the needs of ear, nose and throat specialists who, under existing conditions, are able to devote only a brief period to postgraduate review study. Registration is limited. The fee for the complete course is $50.00. In requesting application for registration, physicians are asked to state school and year of graduation, also details concerning specialty training and experience. Correspondence should be addressed to Department of Otolaryngology, University of Illinois College of Medicine, 1853 West Polk Street, Chicago, Illinois.

CLAY-BECKER MEDICAL SOCIETY

Dr. O. O. Larsen of Detroit Lakes was elected president of the Clay-Becker Medical Society at its annual meeting held at Moorhead recently. Other Officers are Dr. G. L. Gosslee, Moorhead, vice president, and Dr. R. R. Hendrickson, Sand Beach Sanatorium, secretary-treasurer.

STEELE COUNTY MEDICAL SOCIETY

Dr. J. A. McIntyre of Owatonna was elected president of the Steele County Medical Society when members held the annual meeting at the Owatonna City Hospital the latter part of January. Elected vice president and censor for a three-year term was Dr. E. J. Nelson. Dr. D. H. Dewey was elected secretary-treasurer.

Dr. D. E. Morehead was named delegate to the State Medical Association convention with Dr. Dewey as alternate.

UPPER MISSISSIPPI MEDICAL ASSOCIATION

Dr. H. W. Lee of Brainerd was elected president of the Upper Mississippi Medical Association at the annual meeting of the organization held in February at Brainerd. Other members elected to office were: Dr. D. F. McCann of Bemidji, vice president; Dr. L. T. Davis of Wadena, second vice president; Dr. A. H. Borgerson of Long Prairie, third vice president; and Dr. G. I. Badeaux of Brainerd, secretary-treasurer.

Chosen as delegates to the State Association were Dr. B. A. Smith of Crosby, Dr. G. I. Badeaux of Brainerd, Dr. A. M. Watson of Royalton and Dr. J. A. Thabes, Jr., of Brainerd.

WASHINGTON COUNTY MEDICAL SOCIETY

The Washington County Medical Society held its monthly meeting Tuesday evening, February 9, at Stillwater. The scientific program consisted of a colored motion picture showing lesions of the lower bowel, interpreted by William C. Bernstein, M.D., of Saint Paul. Dr. Bernstein presented this difficult subject, important to all medical practitioners, in an interesting and informative manner.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

THE 1942 YEAR BOOK OF GENERAL MEDICINE. 848 pages. $3.00. Chicago: Year Book Pub., 1942.

This yearbook makes its usual valuable contribution to medical literature. It gives a very good review of the important advances in medical diagnosis and treatment as reported in the periodicals in 1941 and 1942 and any physician would do well to go through it carefully. The grouping of articles on specific subjects is a very helpful procedure. The percentage of abstracts of foreign literature is small in this volume, of course, but there are a number from the English, Swiss, Scandinavian and South American literature.

PSYCHOTHERAPY IN MEDICAL PRACTICE. Maurice Levine, M.D., Attending Psychiatrist, Cincinnati General Hospital; Assistant Professor of Psychiatry, University of Cincinnati, College of Medicine. 320 pages. $3.50. New York: Macmillan Co., 1942.

This is a useful and practical book. The author has put much thought and knowledge into it. His thoughtfulness is shown in the manner in which he groups his subjects and in the explanatory treatment he gives them. His knowledge encompasses the more recent psychiatric concepts. While the book is intended for the physician in general practice, it would not be out of place in the library of a psychiatrist.

FRANK H. WHITMORE, M.D.

WHEN DOCTORS ARE RATIONED. Dwight Anderson and Margaret Baylous. 255 pages. $2.00. New York: Coward McCann Inc., 1942.

This is another book for public consumption. The opening chapters attend to the title and its implications. The remaining chapters discuss relationships between doctor and patient and tend to enlighten the public mind concerning the way to go about locating or choosing a reliable physician. It discusses quacks, specialists, women doctors and how to be a good patient. At times the reader might think himself perusing the catalogue of a medical school setting forth the qualifications desirable for a medical student.

Most physicians by this time are amply conversant with the ramifications of the Procurement and Assignment Service. The book deals with this, of course, but the subject is soon exhausted and when the above subjects have been discussed under various headings the final chapters have some rather interesting comments on the subject of controlled medicine which it would be well for the lay reader to peruse and ponder.

ARTHUR N. COLLINS, M.D.

SPENCER
Breast Supports
For Pre-Natal and Nursing



Spencer Maternity Support Spencer Nursing Support

Each Spencer Breast Support for pre-natal wear, like *all* Spencer Supports, is *individually designed* for the one patient who is to wear it, to lift and hold breasts in natural, healthful position, without compression.

It improves circulation—protects delicate inner tissues—helps prevent outer skin from stretching and breaking—aids breathing—improves appearance—encourages erect posture. Easily adjustable to increasing development.

Painful, engorged breasts are often relieved by a Spencer, as it allows veins to empty easily. (A further advantage is gained later in increased milk supply from equalization of circulation during pregnancy.)

GUARDS AGAINST CAKING AND ABCESSING

The Spencer Breast Support for nursing mothers provides protection against caking and abcessing. Padded slide-fastener in front for nursing convenience.

For service look in telephone book under "Spencer Corsetiere" or write direct to us.

SPENCER *INDIVIDUALLY DESIGNED*

Abdominal, Back and Breast Supports

SPENCER INCORPORATED,
137 Derby Ave., New Hoven, Conn.
In Conodo: Rock Island, Quebec.
In Englond: Spencer (Banbury) Ltd., Bonbury, Oxon.

May We Send You Booklet?

Please send me booklet, "How Spencer Supports Aid the Doctor's Treatment."

....M. D.

Address .....

Of General Interest

Dr. Homer B. Annis has moved from Minneapolis to Bluffton, Indiana, where he is associated with the Caylor Clinic.

* * *

Dr. John Thomas Laughlin, who had closed his office temporarily because of ill health, is taking care of office calls again.

* * *

Dr. H. J. Just, formerly of Lafayette, Minnesota, has recently moved to Hastings, where he is practicing medicine in partnership with Dr. R. C. Radabaugh.

* * *

Following his appointment as Assistant Surgeon, USPHS, Dr. Wale S. Wright has been assigned to VD work with the Minneapolis Health Department.

* * *

Dr. H. F. Helmholz of Rochester attended a meeting of the Children's Bureau Commission on Children in Wartime held at the White House, Washington, D. C., in February.

* * *

Dr. W. L. Burnap of Fergus Falls, chairman of the Council of the Minnesota State Medical Association, was elected president of the National Conference on Medical Services at a meeting held in Chicago in February.

Dr. Erling S. Platou of Minneapolis will be guest speaker on pediatrics at the New Orleans Graduate Medical Assembly, March 15-18. Dr. Platou was recently elected president of the Minnesota State Board of Health for the fifth consecutive term.

* * *

A new portable fracture bed will soon be available for the use of residents of Madison, Dawson, Clarkfield, Boyd, Montevideo, Lac qui Parle, Watson, Milan, Louisburg, Bellingham, Nassau, Marietta and the surrounding rural areas as the result of a drive for funds by the American Legion Auxiliary of Madison.

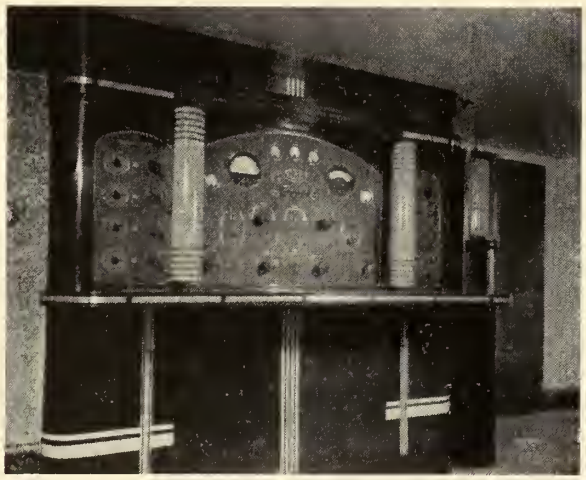
* * *

Dr. F. R. Sanderson, a former Fellow in Surgery at the Mayo Clinic, Rochester, is now professor of surgery and director of the Department of Surgery in Georgetown University School of Medicine. Dr. Sanderson received the degree of M.S. in Surgery from the University of Minnesota while at the Clinic.

* * *

Dr. Lewis Miller Reid, a graduate of the University of Minnesota, 1941, recently completed his internship at the Minneapolis General Hospital and graduate training at the Receiving Hospital, Detroit, Michigan, and is now established in practice at Excelsior, Minnesota. Dr. Reid is continuing the practice of Dr. H. C. Arey,

Radiation Therapy Institute



Control Board

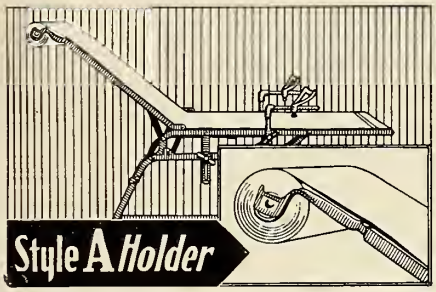
of Saint Paul

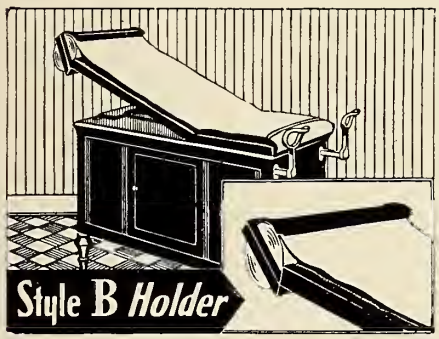
CHARLES T. MILLER HOSPITAL

Facilities for Radium and Roentgen Therapy, Including Million Volt Constant Potential Installation of Most Advanced Design.

You are cordially invited to visit the Radiation Therapy Institute and inspect its facilities

Edward Schons, M.D., *Director* J. P. Medelman, M.D., *Associate Director*





SOLAREUM PAPER TABLE SHEETING

The Modern, Economical Way For Progressive Physicians

Ready at the head of your examining table is a continuous, instant supply of SOLAREUM sheeting. Here, in a sanitary holder that is especially designed to fit any style of table you might have in your office, you have about 700 to 1,000 lineal feet available, quick as a flash, whenever you need it.

SOLAREUM sheeting is purposely made for efficient service in the modern physician's office. It is conveniently, quickly spread over your table, and is pleasant to lie on. There is no crackling noise, no cold feeling, no discomfort to disturb the nervous patient.

SOLAREUM sheeting is inexpensive, saving nearly all or much of the laundry cost, according to the nature of your practice. It gives you a clean sheet for each patient at minimum cost. Distributed over an entire year this saving is well worth considering.

BROWN & DAY, INC.

Saint Paul, Minnesota

who is serving as a medical officer in the United States Navy.

* * *

Dr. Myron O. Henry of Minneapolis is serving as an officer in two orthopedic organizations. He was recently elected president of the Clinical Orthopedic Society (Minneapolis) and secretary-treasurer of the American Academy of Orthopædic Surgeons.

PHYSICIANS IN MILITARY SERVICE

The following members of the Mayo Clinic Staff have received their assignments and are now on extended active service: J. H. Tillisch, Capt., M.C., American Air Force, Army of the United States and G. S. Baker, Maj., M.C., Army of the United States.

Fellows now on extended active service include: R. D. Johnston, Lt., M.C., Army of the United States; H. A. Stout, Lt., M.C., Army of the United States; Talbert Cooper, Lt. (jg), M.C., United States Naval Reserve; John Ambrusko, Lt. (jg), M.C., United States Naval Reserve.

Four Duluth physicians who joined the staff of the Navy Hospital at Bremerton, Washington, in 1941 as lieutenant commanders have been promoted to the rank of commander, according to a news release from the hospital. The four are Drs. Daniel W. Wheeler, P. J. Rudie, Mark Tibbett and L. R. Gowan. They were members of the Minnesota naval reserve and entered active service shortly after the naval reserve was called to duty.

HOSPITAL NEWS

Dr. L. K. Buszelle of Minneapolis has been elected president of the Asbury Hospital staff. Other officers are Dr. C. A. McKinlay, vice president, and Dr. C. E. Stanford, secretary-treasurer.

* * *

At the annual staff meeting of the Union Hospital, New Ulm, the following officers were elected: Dr. C. A. Saffert, president; Dr. H. A. Vogel, vice president; Dr. Theodore Fritsche, secretary.

* * *

Dr. Nesmith Nelson was chosen chief of staff at the annual election of staff physicians of St. Joseph's Hospital, Brainerd. Other officers are Dr. M. P. Gerber, vice chief, and Dr. O. E. Hubbard, secretary-treasurer.

* * *

Members of the Board of Directors of West Central Minnesota Hospital, Graceville, Minnesota, were re-elected at the annual meeting held in January. Officers of the Board are: Dr. C. I. Oliver, president; Dr. Otto Bergan, vice president; Dr. I. L. Oliver, secretary-treasurer.

* * *

The new Myre Hospital at Paynesville was recently opened to the public with Mrs. Edna Wolff in charge. Dr. Clifford Myre has operated a hospital in Paynesville since 1925 and the new establishment is the fulfillment of his plans for better facilities and equipment. It has a capacity of eight beds with an operating room, nursery and laundry

86c out of each $1.00 gross income used for members benefit

PHYSICIANS CASUALTY ASSOCIATION
PHYSICIANS HEALTH ASSOCIATION

Hospital, Accident, Sickness

INSURANCE

For ethical practitioners exclusively
(57,000 Policies in Force)

LIBERAL HOSPITAL EXPENSE COVERAGE	For $10.00 per year
$5,000.00 ACCIDENTAL DEATH $25.00 weekly indemnity, accident and sickness	For $32.00 per year
$10,000.00 ACCIDENTAL DEATH $50.00 weekly indemnity, accident and sickness	For $64.00 per year
$15,000.00 ACCIDENTAL DEATH $75.00 weekly indemnity, accident and sickness	For $96.00 per year

41 years under the same management
$2,418,000.00 INVESTED ASSETS
$11,350,000.00 PAID FOR CLAIMS
$200,000 deposited with State of Nebraska for protection of our members.
Disability need not be incurred in line of duty—benefits from the beginning day of disability.
Send for applications, Doctor, to
400 First National Bank Building Omaha, Nebraska

Sterile Shaker Packages Sulfanilamide,
H.W.&D.

Our total output of 5 gram Sterile Shaker Packages of Crystalline Sulfanilamide, 30–80 mesh, developed by our research staff in co-operation with military authorities for the treatment of wounds in combat zones, has previously been requisitioned for military needs (totaling more than thirty million packages).

Completion of our new Sulfanilamide Division plant ahead of schedule and the resulting increased production has now made it possible for us to supply these packages for civilian medical use.

We will now accept orders for Sterile Shaker Packages of Crystalline Sulfanilamide.

The package will be available only by or on the prescription of a physician.

Complete information and prices on request.

HYNSON, WESTCOTT & DUNNING, INC.
Baltimore, Maryland

housed in a modern fireproof and soundproof building.

* * *

Dr. P. G. Boman is the newly elected chief of staff of Miller Memorial Hospital, Duluth. He succeeds Dr. Carl O. Kohlbry. Other officers are Dr. E. L. Armstrong, vice chief of staff, and Dr. E. E. Barrett, secretary-treasurer. Dr. Kohlbry and Dr. W. J. Ryan are members of the Executive Committee.

* * *

Shall Westbrook have a community hospital? This is one of the live topics among members of the Commercial club of Westbrook. The club at a recent meeting gave considerable time to discussion of the hospital subject and a committee was named to investigate the project.

* * *

Fifteen physicians and surgeons, three from other communities than New Ulm, attended the annual meeting of the Loretto Hospital staff at the hospital, in January. Election of officers following the dinner, resulted as follows: Dr. F. H. Hubbe, president; Dr. C. A. Saffert, vice president; Dr. H. A. Vogel, secretary.

* * *

At the regular meeting of the Staff of Wesley Hospital, Wadena, Minnesota, in February, the following officers were elected: President, Dr. E. C. Hanson; vice president, Dr. A. J. Lewis; secretary-treasurer, Dr. Henry Silver. Dr. Thomas Ziskin of Minneapolis spoke to the staff members in January on "Electrocardiography."

* * *

Carl H. Swanson, state director of public institutions, appeared before the house appropriations committee recently and submitted budgets for four additional state hospitals and the school for feeble minded at Faribault. Special requests for the Fergus Falls institution included $15,000 for repairing and re-shingling roof and main buildings; $15,000 addition to men's buildings for tuberculous patients.

* * *

Dr. E. W. Bedford is new chief of staff of Eitel Hospital, Minneapolis, succeeding Dr. Gilbert J. Thomas. Dr. William R. Jones is new assistant chief and Dr. Alton C. Olson is secretary-treasurer. The new officers were elected at the annual meeting of the hospital staff. Principal speakers at the meeting were Dr. R. W. Backus, medical missionary recently returned from China, and Capt. Beryl Hirschfield of the Army Medical Corps.

* * *

At the annual meeting of the Bethesda Hospital Association, Fertile, Minnesota, Dr. C. L. Oppegaard of Crookston was elected a member of the Board. Officers of the Association are: Alfred Solstad, Fertile, president; O. M. Grovern, Mentor, vice president; Elmer Hanson, Fertile, treasurer and F. H. Stadsvold, Crookston, secretary. Other members of the Board are Theodore Stromstad of Beltrami and Hans Haugen of Nielsville.

(Continued on Page 318)



The Birches Sanitarium, Inc.

2391 Woodland Avenue

Duluth, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Psychiatrists in Charge

L. R. Gowan, M.D. **A. S. Nissen, M.D.**



VOCATIONAL HOSPITAL

. . . An integral part of the Miller Vocational High School offers two special features—Patients receive a maximum of personal attention from student practical nurses—All food is prepared under the direction of a qualified dietitian. Patients remain under the care of their own physicians.

Director of Nurses—M. H. WOLTMAN, R.N., B.S.

Superintendent & Dietitian—H. B. BROWN, B.S.

Physicians may secure services of Vocational nurses by calling Nurses Headquarters and asking for a Vocational Nurse

Bridgeport 2281

5511 South Lyndale - - Minneapolis



Largest Orthopedic Manufacturers in the Northwest

SPECIALISTS!

Extension Shoes and Clubfoot Corrections . . . Abdominal and Arch Supports . . . Braces for Deformities . . . Elastic Stockings . . . Expert Truss Fitters . . .

•

Seelert Orthopedic Appliance Company

88 South 9th Street

Minneapolis MAin 1768

Send us your slow collection items.

All accounts made by personal calls.

We specialize in Medical and Dental Accounts.

Bonded and Licensed Under Minnesota State Laws

Northwestern Adjustment Co.

518 Bremer Arcade Bldg.

St. Paul Minnesota

DANIELSON MEDICAL ARTS PHARMACY, INC.

PHONES:
ATLANTIC 3317
ATLANTIC 3318

10-14 Arcade, Medical Arts Building

825 Nicollet Avenue—Two Entrances—78 South Ninth Street

MINNEAPOLIS

HOURS:
WEEK DAYS—8 to 7
SUN. AND HOL.—10 TO 1

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.

414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.

INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS

MAIN 2494

. . . . . water without minerals is like food without salt

TASTE

GLENWOOD
INGLEWOOD
NATURAL*
SPRING WATER
for home and office



GENEVA 4351

*Naturally Mineralized, Naturally Healthful

Dr. William B. Roberts of Minneapolis was named new chief of staff of St. Barnabas Hospital to succeed Dr. Reuben M. Rosenwald, at the annual meeting in February. Previous to his appointment Dr. Roberts was a member of the hospital's Executive Committee. He has been associated with St. Barnabas for fifteen years and for twenty-five years was chief of staff at Eitel Hospital. He is now a member of the staffs of Eitel and Franklin Hospitals, as well as St. Barnabas. He has been a practicing physician in Minneapolis for forty years.

* * *

E. M. Hauge, superintendent of Fairview Hospital, Minneapolis, was elected president of Minnesota Hospital Service Association at a meeting held in February at St. Joseph's Hospital, St. Paul. Mr. Hauge succeeds James McNee, Duluth.

Other officers elected were: Samuel W. Pinkerton, Saint Paul, vice president; Dr. Peter D. Ward, Saint Paul, secretary; A. A. McRae, Minneapolis, treasurer; Henry Thrall, Minneapolis, assistant treasurer.

Victor M. Anderson, Minneapolis, Dr. Ward, Mr. McRae, Mother Conchessa, Minneapolis, the Rev. L. R. Benson, Saint Paul, and Abbott L. Fletcher, Minneapolis, were named trustees.

* * *

At its annual meeting held in February, the medical staff of St. Mary's Hospital, Duluth, elected Dr. F. N. Knapp chief of staff for 1943, and Dr. Richard Bardon as chief-elect for 1944. Dr. Knapp succeeds Dr. P. F. Eckman.

Other staff officers named are Dr. K. W. Emanuel, secretary; Dr. L. A. Barney, chief of surgery; Dr. S. N. Litman, chief of pediatrics; Dr. C. E. Taylor, chief of contagion; Dr. F. G. Hirschboeck, chief of neurology, and Dr. P. N. Bray, chief of obstetrics. Holdover officers are Dr. C. M. Smith, chief of medicine; Dr. E. Z. Shapiro, chief of urology; Dr. F. J. Elias, chief of orthopedics, and Dr. E. L. Tuohy, chief of laboratory.

Speakers at a dinner, which preceded the election, were Lieut.-Col. Wallace Hunt, Omaha, Nebraska, chief of medical defense for the Seventh Corps area, and Edwin A. Martini, Duluth, president of the Minnesota Arrowhead chapter of the Red Cross.



BUY WAR BONDS

AND

STAMPS



CLASSIFIED ADVERTISING

EQUIPMENT FOR SALE—Hanovia Alpine Lamp—$275.00 model. Never used—new. Will discount 20 per cent. Address D-43, care MINNESOTA MEDICINE.

Zemmer

PRESCRIBE or DISPENSE ZEMMER PHARMACEUTICALS
Tablets, Lozenges, Ampoules, Capsules, Ointments, etc. Guaranteed reliable potency. Our products are laboratory controlled. Write for catalogue.

Chemists to the Medical Profession

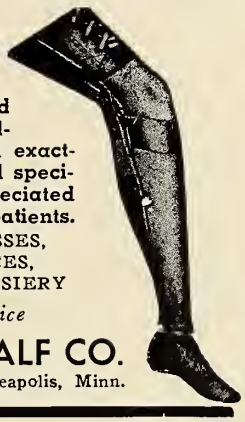
THE ZEMMER COMPANY • OAKLAND STATION • PITTSBURGH, PENNSYLVANIA

MIN 3-43

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.
414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.
INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS
MAIN 2494

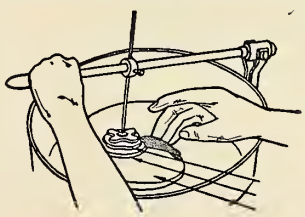
SAVE TIME!
TRY DAHL'S
Biologicals — Dressings
Pharmaceuticals — Surgical Instruments
Hypodermic Medications
Day and Night Service
Joseph E. Dahl Co.
Incorporated
ATlantic 5445 — 82 So. 9th St., Mpls.

Radiological and Clinical
Assistance to Physicians
in this territory
MURPHY LABORATORIES
Minneapolis: 612 Wesley Temple Bldg. - - At. 4786
St. Paul: 348 Hamm Bldg. - - - - - - - Ce. 7125
If no answer, call - - - - - - - - - - Ne. 1291

RELIABILITY!

For years we have maintained the highest standards of quality, expert workmanship and exacting conformity to professional specifications . . . a service appreciated by physicians and their patients.
ARTIFICIAL LIMBS, TRUSSES, ORTHOPEDIC APPLIANCES, SUPPORTERS, ELASTIC HOSIERY
Prompt, painstaking service
BUCHSTEIN-MEDCALF CO.
610 3rd Ave. South — Minneapolis, Minn.

Hall & Anderson
PRESCRIPTION PHARMACY
BIOLOGICALS
PHYSICIANS' SUPPLIES
SAINT PAUL, MINN.
LOWRY MEDICAL ARTS BUILDING
TELEPHONE: CEDAR 2735

★ V ★ V ★ ★ V ★ V ★
CHECKING SERVICE . . .
The American **ECONOMY** *Way*
THE AMERICAN NATIONAL BANK offers a NEW PLAN in Personal Checking Accounts.
This service is offered to those who would like to open a checking account but find it inconvenient to maintain the balance required for regular checking accounts. A charge of 7c is made for each check paid, also a nominal charge on deposits.
Open an account for any amount.
THE AMERICAN NATIONAL BANK
BREMER ARCADE — 7TH AT ROBERT — Cedar 0573
Free Parking
Member Federal Deposit Insurance Corporation
★ V ★ V ★ ★ V ★ V ★

UNUSUAL LENS GRINDING

CATARACT, MYO-THIN and other difficult and complicated lenses are ground to extreme thinness and accuracy by our expert workmen.
ARTHUR F. WILLIAMS
SAINT PAUL
MINNESOTA

Save 25 to 40 Per Cent
Druggists' Mutual Insurance Company
OF IOWA, ALGONA, IOWA
Fire - Tornado - Automobile Insurance
Prompt Loss Service
Minneapolis Branch—S. E. STRUBLE, 835 Palace Bldg.
Home Office—Algona, Iowa



Three of the units

Glenwood Hills Hospitals

3501 Golden Valley Road
Hyland Station
Route Seven

Operated In Connection with Homewood Hospital

Plymouth at Penn Avenue, Minneapolis

FOR NERVOUS DISORDERS

A modern hospital for nervous disorders, built on the cottage plan. The buildings are located on elevated land, affording beautiful views on all sides. Glenwood Hills Hospitals have all the advantages of rural surroundings, and are still only a few minutes by automobile from the Minneapolis loop.

AN INVITATION

The facilities of these institutions are available for all reputable members of the medical profession.

WAUKESHA SPRINGS SANITARIUM



BUILDING ABSOLUTELY FIREPROOF

FOR THE CARE AND TREATMENT OF

NERVOUS DISEASES

BYRON M. CAPLES, M. D., Medical Director
FLOYD W. APLIN, M. D.

WAUKESHA, WIS.

Complete Optical Service

LENS GRINDING
DISPENSING
CONTACT LENSES
EYE PHOTOGRAPHY

N. P. Benson Optical Co., Inc.

Established 1913
Main Office: Minneapolis, Minn.
— BRANCHES —
Aberdeen - Duluth - Eau Claire - Winona
Bismarck - La Crosse - Wausau - Stevens Point
Albert Lea - Rapid City



Orthopedic Braces and Appliances

Physicians' specifications followed precisely.
Scientific manufacture and fitting.

AUGUST F. KROLL

Manufacturer
230 WEST KELLOGG BLVD.
St. Paul, Minn. CE. 5330

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 | April, 1943 | No. 4

Contents

Atypical Pneumonia.
Wesley W. Spink, M.D., Minneapolis, Minnesota.. 337

Neurological Complications Associated With Spinal Anesthesia.
E. M. Hammes, M.D., Saint Paul, Minnesota..... 339

Spinal Anesthesia—Important Principles.
Ralph T. Knight, B.A., M.D., F.A.C.S., Minneapolis, Minnesota 346

Newer Trends in Intravenous Anesthesia.
John S. Lundy, M.D., and *Edward B. Tuohy, M.D., M.S.,* (Anes.), Rochester, Minnesota.... 349

Aerophagia.
G. Hoyme, M.D., Eau Claire, Wisconsin..... 350

The Doctor of Medicine and His Responsibility.
Alfred W. Adson, M.D., Rochester, Minnesota.. 352

Obstetric Hemorrhage.
Arthur B. Hunt, M.D., Rochester, Minnesota.... 355

Postpartum Hemorrhages and Associated Problems.
Horace D. McGee, M.D., Saint Paul, Minnesota.. 363

Delayed Speech from the Standpoint of a Psychologist.
Grace Arthur, Ph.D., Saint Paul, Minnesota.... 369

Vitamin A in the Treatment of Hypertension.
Jacob S. Blumenthal, M.D., and *Macnider Wetherby, M.D.,* Minneapolis, Minnesota 370

Clinical Pathological Conference:
Presentation of a Case.
A. J. Hertzog, M.D., and *S. V. Lofsness, M.D.,* Minneapolis General Hospital..... 372

History of Medicine in Minnesota:
History of Medicine in Dodge County.
James Eckman and *Charles E. Bigelow, M.D.*
(Continued from March issue)..... 373

President's Letter 380

Editorial:
Pneumonia Today 381
The Orr Treatment of Compound Fractures.... 381
AMA Legislative Activity..... 382
Alfred Blalock 383
Buy War Bonds 383

Medical Economics:
The Planning Board Report..... 385
The Council Meets 386
Minnesota State Board of Medical Examiners.. 387
Physicians Licensed February 13, 1943..... 388

In Memoriam 390

Reports and Announcements..... 391

Woman's Auxiliary 393

Of General Interest 394

Book Reviews 396

Contents of Minnesota Medicine copyrighted by Minnesota State Medical Association, 1943

Entered at the Post Office in Minneapolis as second class mail matter. Accepted for mailing at the special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 13, 1918.

MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL ASSOCIATION

Published by the Association under the direction of its Editing and Publishing Committee

EDITING AND PUBLISHING COMMITTEE

E. M. HAMMES, Saint Paul
PHILIP F. DONOHUE, Saint Paul
H. W. MEYERDING, Rochester
H. A. ROUST, Montevideo
B. O. MORK, JR., Worthington
A. H. WELLS, Duluth
O. W. ROWE, Duluth
T. A. PEPPARD, Minneapolis
HENRY L. ULRICH, Minneapolis
C. L. OPPEGAARD, Crookston

EDITORIAL STAFF

CARL B. DRAKE, Saint Paul, Editor
GEORGE EARL, Saint Paul, Associate Editor
HENRY L. ULRICH, Minneapolis, Associate Editor

BUSINESS MANAGER

J. R. BRUCE

Annual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian Subscriptions—$3.50.

The right is reserved to reject material submitted for editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

Classified advertising—five cents a word; minimum charge, $1.00. Remittance should accompany order.

Display advertising rates on request.

Address all communications to Minnesota Medicine, 2642 University Avenue, Saint Paul, or National Bldg., Minneapolis. Telephone Nestor 2641.

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN



MAIN BUILDING—ONE OF THE 5 UNITS IN "COTTAGE PLAN"

A Modern Private Sanitarium for the Diagnosis, Care and Treatment of Nervous, Mental and Medical Cases

Located on beautiful Lake St. Croix, eighteen miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Milk, cream and butter from our own herd of Tuberculin-tested Registered Guernsey Cows. Inspection and coöperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

CONSULTING NEURO-PSYCHIATRISTS

RESIDENT PHYSICIAN
Howard J. Laney, M.D.
Prescott, Wisconsin
Tel. 39

Hewitt B. Hannah, M.D.
Joel C. Hultkrans, M.D.
511 Medical Arts Building
Minneapolis, Minnesota
Tel. MAin 4672

SUPERINTENDENT
Ella M. Mackie
Prescott, Wisconsin
Tel. 69



send the
cigarette that's the

FAVORITE OF THE ARMED FORCES *

FRIEND or relative—send him cigarettes—the first choice among officers and in the ranks—the gift they prefer above all others. The brand? Camels—by actual survey*, first choice of American men in war.

Slow-burning Camels have the features that service smokers want—extra mildness, smooth mellowness, better flavor—every puff.

Your dealer will gladly serve you with Camel cigarettes by the carton; see him today.

Camel

costlier tobaccos

REMEMBER, you can *still* send Camels to Army personnel in the U. S., and to men in the Navy, Marines, or Coast Guard *wherever they are.* The Post Office rule against mailing packages applies only to those sent to the overseas Army.

* With men in the Army, the Navy, the Marine Corps, and the Coast Guard, the favorite cigarette is Camel. (Based on actual sales records in Post Exchanges and Canteens.)



Some men are so clever!

Take my boss for instance . . .

Yesterday, I overheard him talking to another doctor about infant feeding.

"Jim," he said, "I'll tell you why you never have any time to spare. You get yourself tied up with a lot of unnecessary work.

"You believe in prescribing plain cow's milk modified. Haven't you found out that S-M-A* will save you a lot of unnecessary questions? Cut out a lot of bothersome arithmetic?



"Heaven knows, we're busy enough as it is. I'll bet you a couple of tickets for the big game that with S-M-A on the job—your patients won't have to telephone you so often to ask about their baby's formula."

☆ ☆ ☆

Well, you can see why I think my boss is so clever. Why don't you try S-M-A in your own practice, doctor? See if you don't like it better.

BUSY DOCTORS TODAY—PRESCRIBE S-M-A!

With the exception of Vitamin C . . . S-M-A is nutritionally complete. Vitamins B_1, D and A are included in adequate proportion . . . ready to feed. Their presence in S-M-A prevents the development of subclinical vitamin deficiencies . . . because the infant gets all the necessary vitamins right from the start.

S-M-A has still another highly important advantage not found in other modified milk formulas. It contains a special fat that resembles breast milk fat . . . resembles it chemically and physically—according to impartial laboratory tests. S-M-A fat is more readily digested and tolerated by most infants than cow's milk fat.

S-M-A IS EASIER TO PREPARE. ONE MEASURE OF POWDER TO EACH OUNCE OF WARM, BOILED WATER, COMPLETES THE FORMULA . . . TWENTY CALORIES TO THE OUNCE



The infant food that is nutritionally complete

SMA*

*REG. U. S. PAT. OFF.

S. M. A. Corporation
8100 McCormick Boulevard
Chicago, Illinois

ACCEPTED AMERICAN MEDICAL ASSN. Council on Foods

S-M-A, a trade-mark of S.M.A. Corporation, for its brand of food especially prepared for infant feeding—derived from tuberculin-tested cow's milk, the fat of which is replaced by animal and vegetable fats, including biologically tested cod liver oil; with the addition of milk sugar and potassium chloride; altogether forming an antirachitic food. When diluted according to directions, it is essentially similar to human milk in percentages of protein, fat, carbohydrate and ash, in chemical constants of the fat and physical properties.



• *Violence during grand movements is pictured by Paul Richer, one of the distinguished artists of medicine, in his Etudes Cliniques sur L'Hysterio-Epilepsie (1881).*

"A sharp edged weapon which must be used both boldly and deftly."[1]

Dilantin* Sodium (phenytoin sodium) is "recognized as the drug of choice for patients having grand mal or psychomotor seizures. Its usefulness should not be lessened just because its administration requires careful and intelligent supervision by the attending physician. Ignorance or timidity on the part of the doctor has blighted the budding hope of many a patient . . . Epilepsy is a tough disease which laughs at dull weapons."[1]

Kapseals Dilantin Sodium (phenytoin sodium) are providing new relief for many epileptic patients. With its use seizures usually decrease in number and sometimes cease entirely.

*TRADE-MARK REG. U.S. PAT. OFF.

1. Lennox, W. G.: Jl. A.M.A., Oct. 10, 1942

Detailed Literature on Request

Kapseals

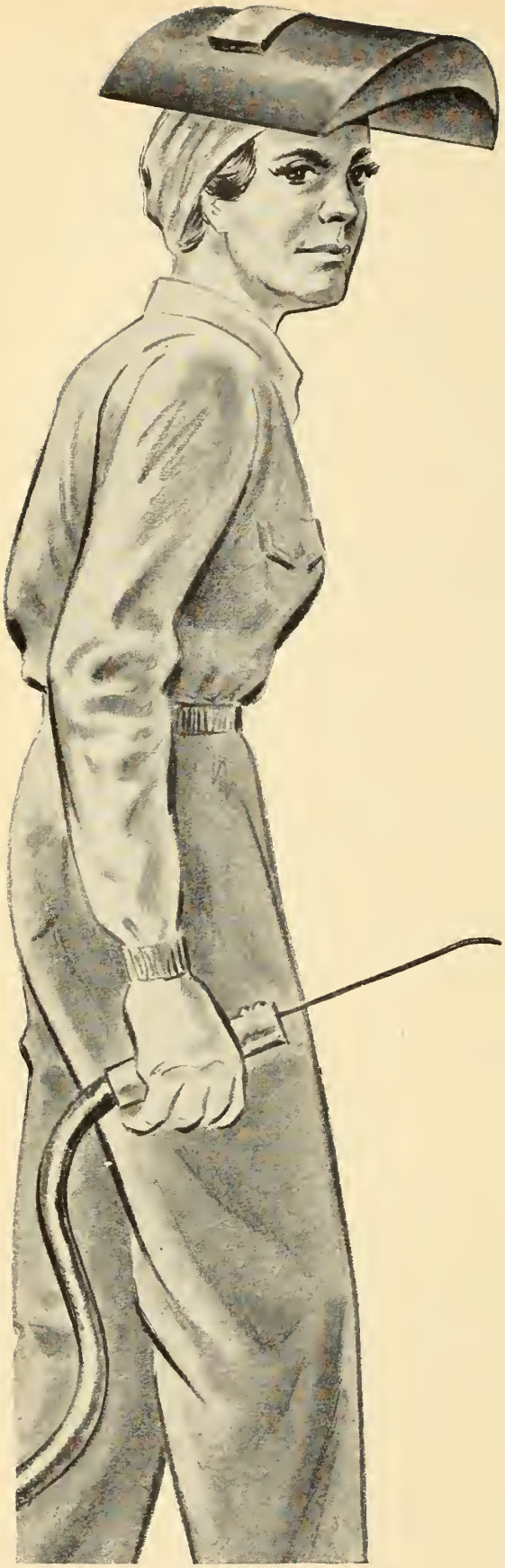
DILANTIN SODIUM

A product of modern research offered to the medical profession by

ARMY E NAVY

PARKE, DAVIS & COMPANY

DETROIT • MICHIGAN



"MANPOWER" . . .
and the Menopause

"MANPOWER" in industry is rapidly changing to "womanpower." And, with so many women on production and assembly lines, the problem of absenteeism and lowered efficiency, particularly among women in their forties, deserves consideration.

It has been estimated that 80 per cent of women in this age group experience menopausal symptoms of varying intensity. Efficiency demands that these workers be physically and emotionally fit. Clinical investigations show that, in a large percentage of cases, they can be kept "on the job" through the use of adequate estrogenic therapy.

The high clinical effectiveness of Amniotin in relieving the distressing vasomotor symptoms of the menopause has been amply demonstrated by numerous clinical reports published during the past 12 years. The product has likewise proved valuable in treating other conditions related to a deficiency of estrogenic substances.

Two New Advantages . . . The new economy-size vials of Amniotin offer two distinct advantages. They provide a substantial saving over the cost of Amniotin in ampuls and they facilitate the use of fractional doses without waste of material.

Differing from estrogenic substances containing or derived from a single crystalline factor, Amniotin is a highly purified, non-crystalline preparation of naturally occurring estrogenic substances derived from pregnant mares' urine. Its estrogenic activity is expressed in terms of the equivalent of international units of estrone. In addition to the economy-vial packages and the ampuls (both of which are for intramuscular injection) you can secure Amniotin in capsules for oral administration and in pessaries for intravaginal use.

ECONOMY-SIZE VIALS	10 cc.	20,000 I. U. per cc.
	10 cc.	10,000 I. U. per cc.
	20 cc.	2,000 I. U. per cc.

For literature address Professional Service Department, 745 Fifth Avenue, New York

Amniotin

A SQUIBB PREPARATION OF ESTROGENIC SUBSTANCES OBTAINED FROM THE URINE OF PREGNANT MARES



Is there any help for an overworked doctor?

YES—BIOLAC, because it saves you valuable time. It's a complete infant formula and there are no extra ingredients to calculate.

Biolac provides completely for all nutritional needs of the young infant except vitamin C.

Prescribe Biolac routinely to reduce the possibility of errors and contamination in formula preparation. It requires only simple dilution with boiled water . . . as you prescribe.

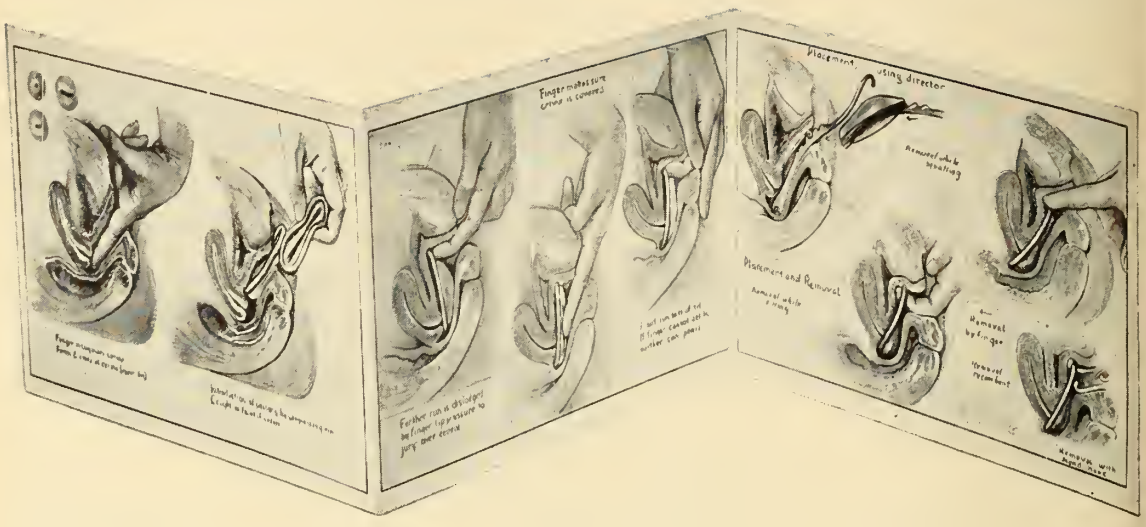
NO LACK IN BIOLAC

Borden's complete infant formula

• *Biolac is prepared from whole milk, skim milk, lactose, Vitamin B_1, concentrate of Vitamins A and D from cod liver oil, and ferric citrate. It is evaporated, homogenized, and* sterilized. *For professional information, write Borden's Prescription Products Division, 350 Madison Avenue, New York City.*

ACCEPTED AMERICAN MEDICAL ASSN.

11th Edition Now Out *Send for Copy*



The Technique *of* Fitting Diaphragms

A series of charts in booklet form (6 x 9) clearly illustrating the technique of fitting diaphragms by the physician, now accompanied by the Dickinson-Freret Charts in two colors. For use by the physician in explaining the technique to his patient. These charts are regarded as the most helpful explanatory aid on the subject ever published. Eleventh edition now out. Write, or use coupon, for a copy.

Holland-Rantos
Company, Inc.
551 FIFTH AVENUE, NEW YORK, N. Y.

Holland-Rantos Co., Inc.
551 Fifth Avenue
New York, N. Y.

Without cost, please send your booklet on Fitting Technique to:

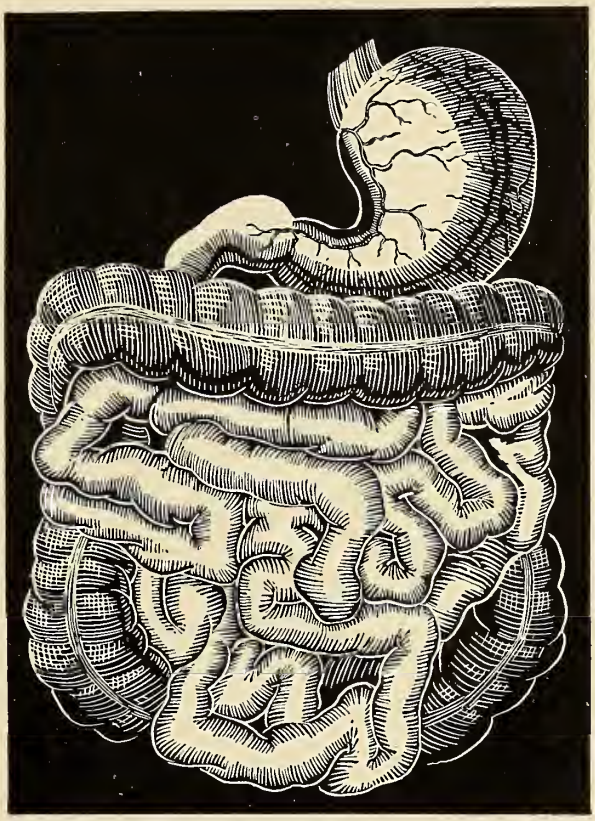
Dr.....

Street.....

City..... State.....

Tranquillity

OF THE G. I. TRACT



TRASENTINE-PHENOBARBITAL is an effective relaxant for central nervous tension and smooth muscle spasm. It was designed to produce relative tranquillity of the G. I. tract.

*TRASENTINE-PHENOBARBITAL** combines the well-known qualities of atropine and papaverine with the time-tested effectiveness of phenobarbital.

Additional benefits occur in that dryness of mouth, palpitation, Mydriasis and Cycloplegia are not found as with atropine administration

TRASENTINE-PHENOBARBITAL

AN EFFECTIVE AUTONOMIC AND CENTRAL NERVOUS SYSTEM SEDATIVE

●

TRASENTINE-PHENOBARBITAL IN BOXES OF 40 AND 100; BOTTLES OF 500

*Trade Mark Reg U. S. Pat. Off.

CIBA *Pharmaceutical Products, Inc.*

SUMMIT, NEW JERSEY

He Likes PABLUM

He will like Pabena too...

PABENA is Mead Johnson & Company's new cooked oatmeal cereal. Pabena has essentially the same nutritional qualities of Pablum and all of its advantages of convenience and economy. 8-ounce packages. Samples on request.



Like Pablum, Pabena is advertised only to the medical profession.

MEAD JOHNSON & CO., EVANSVILLE, INDIANA, U.S.A.

Child Immunization
more essential than ever
in War Time . . .

EVERY PRACTITIONER should be on the alert to encourage immunization programs and to urge immunization in his private practice. The migration of families by the thousands, almost universal decrease in home supervision of children, increasing personal contacts throughout industry, and the relative scarcity of physicians combine to increase the likelihood of the spread of infectious diseases.

As an aid in this work Lederle offers many products of established efficacy for the production of active immunity . . .

Specify **Lederle**













IMMUNIZATION SCHEDULE		
Immunization should be carried out against:	LEDERLE PRODUCT	TIME
Smallpox	Smallpox Vaccine*	6-12 months (revaccinate at 6 and 12 years)
Diphtheria	Diphtheria Toxoids*	6-12 months (Schick Test at 6 years—reimmunize if necessary)
Rabies	Rabies Vaccine*	Promptly after exposure
Immunization is recommended against:	**LEDERLE PRODUCT**	**TIME**
Scarlet Fever	Scarlet Fever Streptococcus Toxin*	After 18 months
Measles	Immune Globulin*	After exposure
Tetanus	Tetanus Toxoid*	Before probable exposure

**Accepted by Council on Pharmacy and Chemistry of the American Medical Association.*

LEDERLE LABORATORIES, INC., NEW YORK, N. Y. — A UNIT OF AMERICAN CYANAMID COMPANY

CONSIDERATION OF IRRITATION OF THE NOSE AND THROAT BECOMES INCREASINGLY IMPORTANT

FIGURES indicate that smoking is at its all-time peak, and is still increasing sharply! *Not to be overlooked* is the advantage provided by PHILIP MORRIS' distinctive method of manufacture. Researches reported *by thoroughly dependable sources** showed that:

WHEN SMOKERS CHANGED TO PHILIP MORRIS EVERY CASE OF IRRITATION OF THE NOSE AND THROAT DUE TO SMOKING CLEARED COMPLETELY OR DEFINITELY IMPROVED.

Reprints of these papers will be gladly forwarded.



PHILIP MORRIS

PHILIP MORRIS & CO., LTD., INC.
119 FIFTH AVENUE, N. Y.

* *Laryngoscope, Feb. 1935, Vol. XLV, No. 2, 149-154*
Laryngoscope, Jan. 1937, Vol. XLVII, No. 1, 58-60



THE SYNDROME OF LOWNESS

LOW MUSCLE TONE, LOW BLOOD PRESSURE LOW RESISTANCE are part of a syndrome characteristic of adrenal cortical insufficiency.

Adrenal Cortex Extract (Upjohn) is a most potent specific therapy now available for alleviation of these typical symptoms, when due to adrenal cortex insufficiency. Adrenal Cortex Extract (Upjohn) is a potent natural complex representing steroids which influence carbohydrate metabolism, capillary tone, vascular permeability, plasma volume, body fluids and electrolytes. "No one of these substances and no synthetic substance has yet been shown to possess all of the effects of a potent cortical extract." N. N. R. 1942

ADRENAL CORTEX EXTRACT (UPJOHN)

Sterile Solution in 10 cc. rubber-capped vials for subcutaneous, intramuscular and intravenous therapy.

Upjohn
KALAMAZOO, MICHIGAN

Another way to save lives
BUY WAR BONDS
FOR VICTORY



REST HOSPITAL

A quiet, ethical hospital with therapeutic facilities for the diagnosis, care and treatment of Nervous and Medical cases. Invites coöperation of all reputable physicians who may supervise the treatment of their patients.

PSYCHIATRISTS IN CHARGE
Dr. Hewitt B. Hannah
Dr. Joel C. Hultkrans

2527 2nd Ave. S., Minneapolis, Phone At. 7369

POKEGAMA SANATORIUM

operated by

H. LONGSTREET TAYLOR FOUNDATION

Reception Hospital



Thoroughly Equipped for the
Medical and Surgical Treatment of

TUBERCULOSIS

Artificial pneumothorax, oleothorax, phrenicectomy, thoracoplasty, pneumolysis, bronchoscopy, alpine lamp and heliotherapy. Operating, throat, dental and lamp rooms. Complete clinical and X-ray Laboratories.

Electric Blankets in All Beds

A reduction has been made in rates.

Railroad, Bus, Telegraph and Telephone Stations: Pine City, Minn. Descriptive circular sent on request.

F. F. CALLAHAN, M.D., Medical Director
POKEGAMA, PINE COUNTY, MINN.

CHILDREN ADMITTED

Highly Active

BACTERIOSTATIC AGENT

Sulfathiazole exerts a prompt bacteriostatic effect upon a number of pathogenic organisms. A pronounced action is observed on the following:

PNEUMOCOCCUS • STAPHYLOCOCCUS
GONOCOCCUS • MENINGOCOCCUS

Remarkable clinical results have been consistently obtained in infectious conditions caused by these organisms. Complications which are commonly encountered in pneumonia, gonorrhea or meningitis are greatly reduced in frequency and severity.

The dosage should be adjusted to the nature of the disease, as well as to the age and condition of the patient. Write for dosage chart and booklet on Sulfathiazole-Winthrop.

Sulfathiazole-Winthrop is supplied in tablets of 0.5 Gm. (7.72 grains), bottles of 50, 100 and 500; also (primarily for children) in tablets of 0.25 Gm. (3.86 grains), bottles of 50, 100 and 500. Sterile powder is available in bottles of 5 Gm., ¼ lb. and 1 lb.



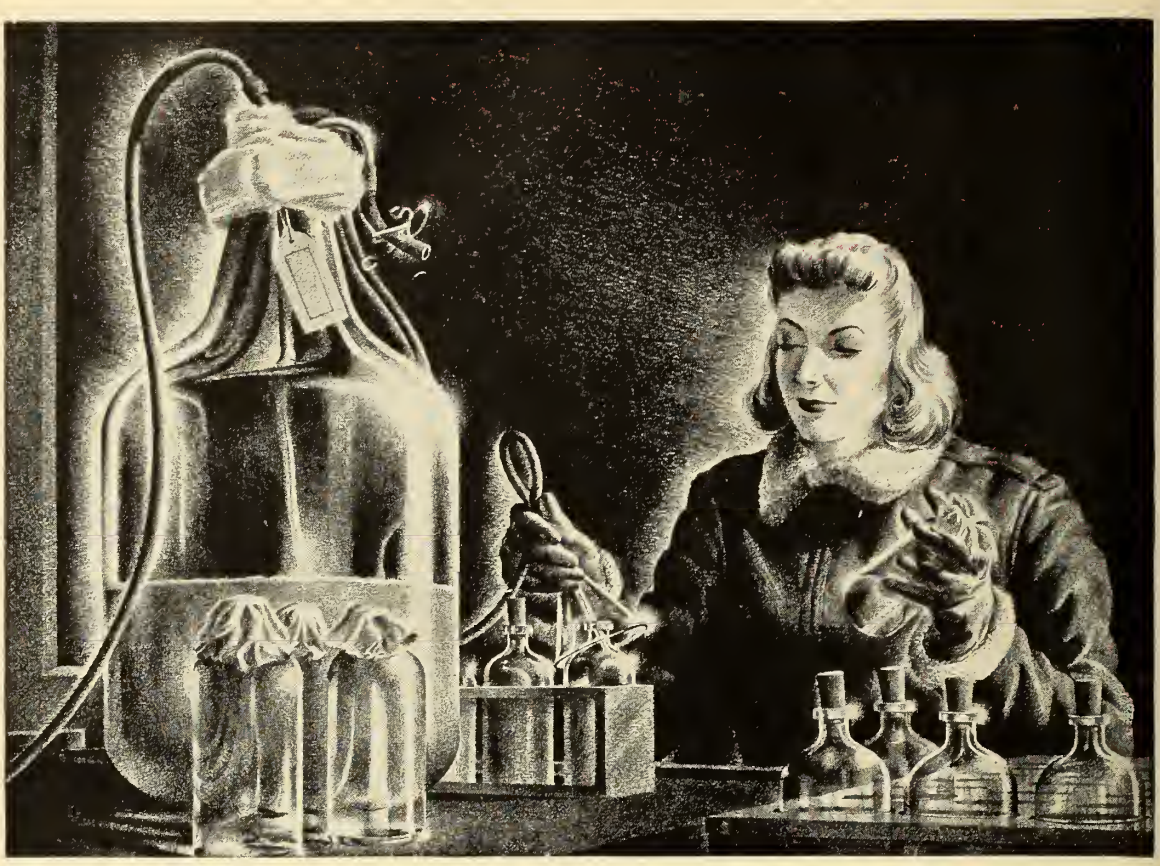
ACCEPTED
AMERICAN MEDICAL ASSN.
Council on Pharmacy and Chemistry

Specify SULFATHIAZOLE *Winthrop*

WINTHROP

Winthrop CHEMICAL COMPANY, INC.
Pharmaceuticals of merit for the physician
NEW YORK, N. Y. WINDSOR, ONT.

BLOOD FOR THE BRAVE



Fighting men are losing blood! . . . blood which must be replaced by mothers and schoolgirls, merchants and laborers, the office boy and the business executive. Fighting men are getting blood—thousands of units collected by the Red Cross in a united effort for United Nations.

In the Lilly laboratories men and women in fleece-lined clothing work in low-temperature rooms where blood, generously donated, is reduced to plasma, frozen, and dried. Plasma is processed by Eli Lilly and Company, without profit, for exclusive use by the armed forces.

Lilly

BUY WAR BONDS AND STAMPS

ELI LILLY AND COMPANY · INDIANAPOLIS, INDIANA, U. S. A.

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 April, 1943 No. 4

ATYPICAL PNEUMONIA

WESLEY W. SPINK, M.D.
University of Minnesota Medical School
Minneapolis, Minnesota

CONSIDERABLE attention has been focused in recent years upon a type of pneumonia of doubtful etiology. Apparently, physicians in various parts of the country in civilian and military practice have encountered a considerable number of cases occurring sporadically and in epidemics. Failure to establish a diagnosis of bacterial origin has given rise to the terms of "atypical" pneumonia, or "virus" pneumonia. Whether or not a new clinical entity has been introduced within the last decade is not known. Reimann is of the opinion that the syndrome has occurred in the past, and its common recognition at present is due to the more frequent use of x-ray films for diagnostic purposes, the common use of precise bacteriological methods in the diagnosis of pneumonia, and the control of pneumococcic pneumonia with chemotherapy. Furthermore many of the cases of atypical pneumonia in the past may have been labelled as bronchopneumonia or capillary bronchitis.

The clinical features of atypical pneumonia appear to follow a general pattern, but there may be confusing variations from individual to individual, and also in patients in different geographical areas. The incubation period is not definitely known. The onset of illness is usually gradual with the patient exhibiting a feeling of malaise, chilly sensations and headache. In some instances, the headaches have been quite severe, and body aches and pains have been prominent complaints. Sore throats are not of particular significance. A cough may be most distressing, either nonproductive or resulting in a mucoid, tenacious or purulent sputum. Rusty or frankly bloody sputum is not encountered, but blood streaked sputum has been observed. An outstanding feature of several patients seen at the University Hospitals has been the presence of an irritating and almost constant nonproductive cough, which if untreated leaves the patient extremely uncomfortable and exhausted. Pleuritic pain occurs very infrequently. Perhaps the most outstanding features on physical examination are the minimal or absent changes in the chest when compared to the roentgenographic findings. Careful examination of the chest may elicit a diminution of the percussion note and breath sounds over the involved areas, and the presence of occasional moist râles. The roentgen film commonly reveals a patchy type of infiltration, although a lobar distribution has also been noted. The latter lesion may or may not be associated with varying degrees of atelectasis. The leukocyte count is usually within a normal range, through leukopenia has been encountered in some cases. Leukocytosis may occasionally be demonstrated after several days of illness. The clinical course and duration of the disease vary. Bradycardia has been observed frequently. The temperature may be only slightly elevated, depending upon the severity of the illness. On the other hand, an appreciable rise in temperature may mark the onset and continue for ten days to three weeks, and then gradually decline by lysis. Chills are not an uncommon occurrence. An acutely ill patient frequently exhibits cyanosis and dyspnea. The individual with a mild form

A résumé prepared at the request of the Editor.

of the disease convalesces rapidly, but a return to a normal state of well-being may be prolonged for several weeks in the more seriously ill patients. The mortality rate is extremely low, and complications are rare. The latter include sterile pleural effusions and thrombophlebitis involving the leg vessels.

Atypical pneumonia also occurs in infants and young children. Dr. John Adams and his associates[1] in the Department of Pediatrics at the University of Minnesota have described two epidemics of respiratory infections occurring in infants up to thirty-two weeks of age. The outstanding clinical features were cough, cyanosis and dyspnea. Pulmonary lesions, particularly of the upper lobes, were observed. The mortality rate for the whole group was 20 per cent, but a rate of 82 per cent occurred in the prematurely born infants. Highly suggestive evidence would indicate that the epidemics were due to a virus.

In the great majority of cases of atypical pneumonia, no etiological agent has been identified. The sulfonamides have been given to a considerable number of patients by competent investigators, and there is general agreement that the drugs do not possess any specific therapeutic value. Nevertheless, physicians confronted by acutely ill patients with evidence of pneumonia, and a febrile course that may extend two to three weeks in duration, have prescribed one of the sulfonamides. Since toxic reactions due to the sulfonamides are most likely to occur after the seventh day of chemotherapy, on many occasions the course of a patient's illness has been punctuated by drug reactions such as fever, chills, a skin eruption, and renal complications. Therefore, any one who elects to administer a sulfonamide for several days may find himself in the dilemma of not having altered the natural course of the disease, and of precipitating the patient into a more serious sequence of events because of the drug. On the other hand, pneumonia of pneumococcic origin may present an atypical clinical picture, and the patient may not yield a satisfactory specimen of sputum for diagnostic purposes, or laboratory facilities may not be readily available for a bacteriological diagnosis. It is well established that sulfonamide therapy is definitely indicated in patients with pneumococcic pneumonia. Therefore, it is the policy at the University Hospitals to give the acutely ill patient having a high fever and evidence of pulmonary infiltration the benefits of sulfonamide therapy for thirty-six to forty-eight hours. Full therapeutic doses of sulfadiazine or sulfathiazole, as advocated for the treatment of pneumococcic pneumonia, have been used. The average case of pneumococcic pneumonia will show a desired response to such therapy within this period of therapy. If the patient has not improved in this time, and diagnostic procedures such as blood cultures and sputum examinations do not reveal a bacterial origin for the illness, sulfonamide therapy is discontinued. But if prompt improvement in the patient's condition follows shortly after sulfonamide therapy has been started, treatment is extended for a few more days until a normal temperature is established. The practice of prescribing smaller prophylactic doses of a sulfonamide as long as the patient has fever has been omitted. Sulfonamide therapy is not instituted in patients having a low-grade fever, although a pulmonary lesion may be present.

With no specific treatment available, attempts should be made to keep the patient comfortable. If a moderate degree of cyanosis or dyspnea is present, oxygen therapy is indicated. The distressing cough should be controlled with opiates if necessary. Sedation with small doses of one of the barbiturates should be instituted. And finally, meticulous nursing care should be made available.

Several attempts have been made to identify the causative agent of atypical pneumonia. These efforts have been accompanied by interesting and significant results. The virus of epidemic influenza may produce pulmonary lesions, but available evidence would indicate that only a relatively few cases of atypical pneumonia up to the present have been caused by this virus. It has been known for a number of years that the virus of psittacosis may cause an atypical form of pneumonia. It has also been recognized that birds of the psittacine group such as parrakeets (love birds), parrots, cockateels, and so forth, are carriers of this virus. Recently, Meyer and his group[5] have pointed out that other species of birds may harbor the virus. It is now established that pigeons in apparent good health may carry the virus, and act as a source of human infections. Smadel[7] of the Rockefeller Institute has recently shown that ten of forty-five cases of sporadic atypical pneumonia occurring in large urban populations were caused by the virus of psitta-

cosis. Several of the patients, but not all, had been exposed either directly or indirectly to pigeons. It is of interest that the virus of lymphogranuloma venereum is closely related to the virus of psittacosis, and a few cases of atypical pneumonia have been caused by the former. Rarely, the virus of lymphocytic choriomeningitis may result in atypical pulmonary infiltrations. There is some evidence that the virus of cat pneumonitis may be the source of human cases of atypical pneumonia. Quite recently, Eaton and his group[2] in California have isolated an ill-defined infectious agent of low virulence for cotton rats from human cases of atypical pneumonia. Similar observations have just been reported by Horsfall and his associates[4] of the Rockefeller Institute.

Another interesting development is the isolation of a filter-passing rickettsia from human beings having an acute febrile illness with pneumonitis.[3] The term "American Q fever" has been given to this syndrome, because the etiological agent is identical with a species of rickettsia identified in Australia. The Australian investigators have described a human illness due to this organism and have called it Q fever.

It is becoming more and more apparent that atypical pneumonia is probably a disease due to a number of different etiological agents. It is not unlikely that the majority of cases are of virus origin. Since only a few laboratories with highly trained personnel are in a position to carry out precise diagnostic investigations as to the cause of atypical pneumonia, it is suggested that practicing physicians and institutions utilize the terminology recommended by the Surgeon General of the U. S. Army; that is, "primary atypical pneumonia, etiology unknown."[6] The term "virus pneumonia" should be reserved for those cases where a virus has been demonstrated as the causative agent.

References

1. Adams, J. M., Green, R. G., Evans, C. A., and Beach, N.: Primary virus pneumonitis: a comparative study of two epidemics. Jour Pediat., 20:405, 1942.
2. Eaton, M. D., Meikeljohn, G., Van Herick, Wm., and Talbot, J. C.: An infectious agent from cases of atypical pneumonia apparently transmissible to cotton rats. Science, 96:518, (Dec. 4), 1942.
3. Hornibrook, J. W., and Nelson, K. R.: An institutional outbreak of pneumonitis. I. Epidemiological and clinical studies. Pub. Health Rep., 55:1936, 1940.
4. Horsfall, F. L., Jr., Curren, E. C., Mirick, G. S., Thomas, L., and Ziegler, Jr., J. E.: A virus recovered from patients with primary atypical pneumonia. Science, 97:289, 1943.
5. Meyer, K. F.: The ecology of psittacosis and ornithosis. Medicine, 21:175, 1942.
6. Official Statements: Primary atypical pneumonia, etiology unknown. War Med., 2:330, 1942.
7. Smadel, J. E.: Atypical pneumonia and psittacosis. Jour. Clin. Invest., 22:57, 1943.

NEUROLOGICAL COMPLICATIONS ASSOCIATED WITH SPINAL ANESTHESIA (Eight Cases)

E. M. HAMMES, M.D.
Saint Paul, Minnesota

A SYMPOSIUM on anesthesia is appropriate at this time. It is just one hundred years ago that an anesthetic was used successfully for the first time in surgery. In ancient times, Egyptian surgeons used pressure on blood vessels and nerve trunks to block sensation peripherally, and the Greeks and Romans employed opium and mandragora in wine to alleviate the suffering during operations. On March 30, 1842, Dr. Crawford Long,[31] of Jefferson, Georgia, removed a small tumor from the neck of a patient, to whom ether (three hundred and two years after its discovery and forty-seven years after it was first used medicinally) had been administered as an anesthetic. However, it was not until 1846, when Doctors Bigelow and Warren[5] demonstrated its use for surgical purposes, before a large audience at the Massachusetts General Hospital at Boston, that it gradually became employed to make modern surgery possible. In 1847, Simpson,[25] in Edinburgh, introduced the more rapidly acting chloroform. In 1879 and again in 1901 the British Medical Society[13] published a report condemning its indiscriminate use. In 1872, Ore,[13] of Lyons, injected a chloral hydrate solution intravenously, and thus was the first one to use this method for anesthetic purposes.

In 1884 Halsted[13] introduced local anesthesia by injecting cocaine intradermally. Corning[8] published his first report on spinal anesthesia in 1885, when he injected cocaine hydrochlorate in the immediate neighborhood of the spinal cord. Experimental studies and clinical observations have greatly improved this method. By refinement in technique and safer and less toxic anesthetics, spinal anesthesia has become one of the

From the Department of Neuropsychiatry, Medical School, University of Minnesota. Part of a Symposium on Anesthesia, presented at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 30, 1942.

methods of choice for many surgeons.[2,19,24] Some workers believe that the associated complications can be avoided in most cases. Vehrs,[28] referring to novocaine, states that none of the complications encountered are due to the novocaine or to the method, but is either inherent in the disease or due to poor technique. In a series of 3,000 cases, Foss and Shwalm[12] did not observe the slightest evidence of peripheral neuritis or sensory or motor disturbances. Lundy[22] suggests that many of the accidents following the use of spinal anesthesia in man are due to factors other than the action of the anesthetic agent, and that it seems probable that when paralysis follows the use of ordinary doses of a spinal anesthetic, the spinal cord was previously diseased. Koster and Kasman[17] were unable to demonstrate any pathologic changes in the spinal cord of autumn frogs or in human cords after spinal anesthesia. Davis and his co-workers,[10] on the other hand, believe that the various spinal anesthetics are both hemolytic and myelitic. In experimental studies on dogs, they found a varying degree of inflammatory reaction in the leptomeninges, which was constantly present; also passive changes in the ganglion cells of the gray matter of the cord, swelling and fragmentation of the axis cylinders and signs of degenerative changes in the fiber tracts of the cord, which were not pronounced after ninety days, and probably not permanent. Haven[14] found a similar inflammatory reaction of the meninges, which in the older animals reached a stage of fibrotic scarring.

Spielmeyer[27] obtained similar degenerative changes in the spinal cord itself with stovaine, and states that these reactions were due to contact effect of the drug on the myelin sheaths. Lundy[22] and his coworkers report similar degenerative reactions in dogs with procaine hydrochloride. Lindemulder[21] noted similar results with apothesine in two patients with postmortem findings, and pointed out the toxic effect of spinal anesthetics on the spinal cord and spinal nerve roots.

Behrens and Riggs[4] emphasize that marked circulatory depression by paralysis of the nerves which control vaso-constriction can be produced by spinal anesthesia. Watter[29] reports a case of hemiplegia following a spinal anesthetic of neocaine and nupercaine, and states that anoxia due to impaired circulatory efficiency was a precipitating factor. Critchley[9] reported a similar case of a few hours' duration, probably caused by a cerebral spasm or small thrombus, due in part to an associated vascular disease. Hayman and Wood[15] suggest that abducens paralysis following spinal anesthesia is not due to the toxic effect of the drug but probably due to a disturbance in dynamics of the spinal fluid.

A wide variety of neurological complications, either immediate or remote, mild or severe, may follow spinal anesthesia. Some undoubtedly are not recognized; many are not reported in the literature. In Ashworth's[1] series of 202 cases, he observed four cases with neurological sequelæ. Lindemulder, in eleven consecutive cases for prostatectomy with spinal anesthesia (apothesine), noted in three cases persistent leg pains for several months, with two deaths, twelve and twenty days postoperative. Barrie[3] reported eleven cases of meningitis, with one fatality, following spinal anesthesia. This could not be attributed to the drug but probably to contaminated water from a Berkefeld multiple filter. Critchley[9] reported eight patients with urinary retention, all in the sixth and seventh decade, except one woman, aged 40. Three of these showed clinical improvement within a few weeks; in four others, however, the symptoms persisted without aggravation up to the time of death. He believes that this syndrome is due to a noxious effect upon the cauda equina and conus medullaris, directly due to the anesthetizing substance. Ferguson[11] reported thirteen cases following durocaine or strovaine spinal anesthesia. In a thorough review of the literature, comprising over 60,000 cases of spinal anesthesia, Light[20] and his coworkers listed as sequelæ: (1) headaches; (2) sensory disturbances; (3) cranial nerve involvement, especially the 6th; (4) impaired bladder and rectal function. They also noted other more serious spinal root and cord disturbances.

Preexisting disease of the central nervous system is given as a definite contraindication to spinal anesthesia. It is a well-recognized fact that cerebral trauma of variable degree may precipitate, aggravate or accelerate the degenerative process of general paresis or cerebral arteriosclerosis.[26] Organic diseases of the spinal cord may be similarly affected.[16,30] Spinal anesthesia may likewise precipitate or aggravate a preexisting spinal cord disease that would have come on gradually at a later period, or would have progressed less rapidly if the spinal anesthetic had

not been given. The depressing effect on the circulation and the hemolytic and myelitic action of the toxic drug evidently hasten the degenerate process and increase the clinical symptoms. Many patients are still subjected to this unnecessary risk. In acute surgical emergencies, where the time element is so important, occasions may arise where it seems excusable. In cases where ample time and opportunity for careful study are available, a spinal anesthetic should not be administered. A history of a previous organic central nervous system disease or a careful neurologic examination revealing any cerebral or spinal cord disease are definite contraindications.

The following five cases are illustrative:

Case 1 (combined sclerosis of the spinal cord)—A. N., female, aged forty-eight, referred by Dr. C. C. Chatterton of Saint Paul, had suffered from pernicious anemia for five years. Her hemoglobin had varied between 45 and 92 per cent and red blood count between 2,100,000 and 4,820,000, with a typical blood smear and gastric findings, under liver therapy. She had no neurological complaints during this entire period except for occasional numb sensations in both feet. At the time of operation for a benign ovarian tumor, the hemoglobin was 82 per cent; red blood count 4,200,000. The neurological examination was negative except for moderately increased knee-jerks. No record of a sensory examination was noted on the hospital sheet. The operation was uneventful and was performed under spinocaine spinal anesthesia at the third lumbar interspace. She stated that at the time of the injection it felt as if the needle was piercing some nerves; sharp shooting pains radiated down the legs and the legs felt as if they were drawing up. The surgical convalescence progressed satisfactorily. On the third postoperative day, she developed a dull aching pain in both legs and some numb sensations in her hands. This continued and eleven days later, when she attempted to get up, she was unable to walk without assistance because of lack of balance and because she "could not tell where she put her feet." She has been unable to walk without assistance since that time. She also developed some bladder disturbances. I first saw her one year after her operation and she presented a typical picture of a combined sclerosis of the spinal cord. The cranial nerves were normal. Both upper extremities were normal except for an ataxia with the finger to nose test, and impaired tactile, pain and vibratory sense on the palmar and dorsal surface of both hands. The Romberg was 4 plus. Her gait was ataxic and she could walk only with assistance. Both knee and ankle jerks were 3 plus, a bilaterally positive Babinski and ankle-clonus were present. Tactile and pain sense were diminished from the level of the umbilicus down, including both lower extremities, where position and vibration sense were also lost.

Her hemoglobin was 84 per cent; red blood count 4,500,000; leukocytes 7200; gastric analysis normal except for the absence of free hydrochloric acid. Her blood Wassermann was negative; spinal fluid clear, pressure 170 mm. water, no bloc, globulin a trace, cells 17 lymphocytes, Wassermann and colloidal gold negative, quantitative protein 38 mg. per 100 c.c. basal metabolism —15, blood pressure 140 systolic, 80 diastolic. There was no further improvement under liver therapy. Legal action was instituted by the patient and a settlement was made out of court.

In this case the clinical neurologic syndrome and presumably the degenerative changes in the spinal cord progressed more rapidly than is usually encountered in combined sclerosis associated with pernicious anemia. It would seem that the toxic effect of or the circulatory changes produced by the spinal anesthetic were at least in part responsible for this fairly acute development. All cases of pernicious anemia should be considered as potential combined sclerosis of the spinal cord when determining what anesthesia to use. This case well illustrates the danger of medico-legal complications in organic neurological disease, where a spinal anesthesia is employed.

Case 2 (multiple sclerosis).—C. L., female, aged twenty-nine, had her first attack of diplopia on September 20, 1937, of one month's duration, with recovery. She remained well until August 16, 1938. On awakening that morning she noticed marked "prickly sensations" in both feet, which extended to the knees within three days, and her gait became somewhat awkward. Examination on August 21, 1938, was negative throughout except for absent left abdominal reflexes, moderate hypertonicity of both lower extremities, a left positive Babinski, and indefinite sensory impairment over both feet. All laboratory findings were normal except the spinal fluid. The spinal fluid was clear, pressure 160 mm. water, no bloc, 12 cells, negative Wassermann, colloidal gold curve 3332100000, quantitative protein 70 mg. per 100 c.c. A diagnosis of multiple sclerosis was made. Her symptoms subsided after five weeks, except for a positive left Babinski. She remained well until March, 1939, when she had a recurrence of her previous symptoms with diplopia, numbness of her left hand and vertigo. She again recovered clinically, and during her entire illness was able to continue with her work as a stenographer. She remained well until January 12, 1942 (almost three years), when she had an attack of acute appendicitis. An appendectomy was performed under spinal anesthesia. Novocaine crystals 130 mg. in 2 c.c. spinal fluid were injected in the third lumbar interspace. Because of the urgent need for immediate operation, the surgeon had not obtained her previous neurological history. The operation and surgical convalescence were uneventful. On the fourth postoperative day she complained of diplopia, weakness and numbness of both lower extremities and difficulty in voiding.

Examination on the sixth postoperative day revealed that the patient was somewhat depressed and emotional. All cranial nerves were normal except for a paresis of the left abducens. The upper extremities were negative except for a bilateral intention tremor. All abdominal reflexes were absent. The right lower extremity was hypotonic, muscle strength greatly reduced, knee and ankle-jerks diminished, no clonus, normal plantar response. The left lower extremity was spastic and ataxic, knee and ankle jerks increased, Babinski positive. Sensation was normal over the face, trunk and both upper extremities. Over the entire right leg, from Poupart's ligament down, tactile, pain and temperature senses were markedly impaired. The outer surface of the left thigh was similarly involved. She also had urinary incontinence. The spinal fluid was clear, pressure 165 mm. water, no bloc, 4 cells, Wassermann negative, colloidal gold curve 2344310000, quantitative protein 52 mg. per 100 c.c. Her condition has remained the same, with very little change in the clinical picture.

Two similar cases of multiple sclerosis, in which the symptoms appeared to progress rather rapidly following a spinal anesthesia were observed at the Mayo Clinic.[23] Critchley[9] reported a case of a male, aged twenty-eight years, who for several years had attacks of vertigo. These improved to such a degree that he was able to join the regular Army. He was operated upon for a derangement of the knee joint, under spinal anesthesia. On the third postoperative day he developed a retrobulbar neuritis, and some time later a typical multiple sclerosis. It is difficult to evaluate the causative relationship in these cases.

Although multiple sclerosis has its remissions and exacerbations without any definite cause, it seems significant that the progress of the disease in each instance was unusually rapid and marked following spinal anesthesia.

Case 3 (tabes).—F. B., male, aged thirty-seven, was referred by Dr. H. B. Zimmerman, Saint Paul. His family and personal history were negative and he had no previous preoperative neurological manifestations. He was admitted to the Miller Hospital on April 27, 1938, with an acute abdomen. Within a few hours a gangrenous appendix was removed under spinal anesthesia, 150 mg. novocaine in 3 c.c. of spinal fluid at the third lumbar interspace being used. The postoperative and surgical convalescence were uneventful. On May 2, the fifth postoperative day, the patient complained of numbness and severe shooting pains in both lower extremities, with some impairment of bladder control. Neurological examination at this time revealed pupils equal and round, very sluggish to light, absent knee and ankle jerks, no clonus, normal plantar response, muscle strength normal, no nerve trunk tenderness, ataxia with the knee heel test. In both lower extremities, tactile, pain and position senses were impaired. After he was able to get up, the Romberg was positive and his gait was ataxic. Hemoglobin was 82 per cent, red blood count 4,620,000, leukocytes 8,400; urine normal; blood pressure 120 systolic, —70 diastolic; blood Wassermann 4 plus. The spinal fluid was clear, pressure normal, 12 cells (lymphocytes), globulin trace, Wassermann 4 plus, colloidal gold curve 2343210000. Under antileutic treatment, he made satisfactory improvement, so that after four months he was able to return to his occupation as a clerk. He continued treatment and the tabes has become stationary.

Case 4 (general paresis).—C. M., male, aged fifty-nine years, was admitted to the surgical service at the Ancker Hospital, Saint Paul, on January 19, 1942. His personal history was negative except for marked alcoholism, until 1939, and a right inguinal hernia of six years' duration. The neurological examination was negative except that both pupils were irregular in outline. The light reflex in the right pupil was normal; in the left there was only a slight response. The mental examination revealed no abnormalities and he appeared normal during his two preoperative days at the hospital. On January 21, 1942, at 9:45 a.m. a right inguinal herniorrphy was done, under spinal anesthesia. Novocaine crystals, 150 mg. in 2 c.c. of spinal fluid, were injected at the level of the third lumbar interspace. The operation was uneventful and the patient was returned to the ward in good condition. He was normal mentally until about 6 p.m., eight hours postoperative. He then became irrational, noisy, disoriented and extremely restless. He refused to stay in bed. The following day restraints were necessary; he refused to eat, became abusive and profane. He appeared terrified because he thought someone was trying to kill him. His phychosis continued. On January 28, 1942, he was examined by Dr. George Ruhberg, of the Neuropsychiatric Department, and a diagnosis of probable general paresis was made. Examination on February 1, 1942, was negative except for irregular and sluggish pupils and moderately increased knee jerks. He was noisy, profane and rambling in his conversation, would not answer questions, had involuntary urine and stool. He was given two intravenous injections of 3 gm. tryparsamide. On February 9, 1942, he developed a bronchopneumonia, with a temperature of 104 for six days, then gradually recovered from the pneumonia. There was no improvement in the psychosis after the tryparsamide injections or after the period of hyperpyrexia. He developed an exfoliative dermatitis, which gradually subsided. He had been given tryparsamide, sulfathiazole and sodium luminal in large doses. His psychosis progressed and within six weeks he presented a dementing type of general paresis. On March 6, 1942, he was committed to the State Hospital for the Insane. On January 20, 1942 his hemoglobin was 74 per cent; red blood count 4,040,000; leukocytes 8,100; urine normal; blood pressure 130 systolic, 60 diastolic. On January 23, 1942, his blood Wassermann was 4 plus. On February 4, 1942, the spinal fluid was clear, contained a trace of globulin, 10

ells, all lymphocytes, quantitative protein 76 mg. per 00 c.c., Wassermann 4 plus, colloidal gold curve 555543-100.

These two cases of syphilis of the central nervous system, both precipitated following spinal nesthesia, emphasize the importance of careful neurological examination. Suggestive signs, such s sluggish pupils, warrant delay until laboratory tudies have been completed before determining he anesthetic to be selected.

We have observed several patients with tabes nd one with cerebral vascular syphilis, who did ot show any increase in the neurological syndrome following spinal anesthesia for abdominal urgery. Clinical experience would suggest that ome other type of anesthesia would be accompanied with less risk.

Another interesting organic neurological patient, who was examined last winter, developed further neurological complications following pinal anesthesia. This man, aged seventy, had n apoplectic attack, with a left hemiplegia, eighteen months previously. After a prostatectomy nder metacaine spinal anesthesia, he developed a severe radiculitis with a flaccid paraplegia.

The following three cases did not manifest any preoperative neurological symptoms or signs.

Case 5 (chronic adhesive arachnoiditis, with probable ascending myelitis).—M. J., female, aged twenty-one, was referred by Dr. R. F. Mears, Northfield, Minnesota, on February 10, 1942. Her personal history revealed that since May, 1941, she had had repeated attacks of right lower abdominal pain, accompanied by a low grade temperature and a leukocytosis around 9500. On October 15, 1941, she was given a spinal injection of 0.5 c.c. of 20 per cent metacaine diluted in 3.5 c.c. spinal fluid in the third lumbar interspace. The spinal fluid was normal in color. Within ten minutes her respiration ceased. Artificial respiration was resorted to and an intravenous injection of 3 c.c. of metrazzol was administered. After forty-five minutes she appeared normal. She complained of numbness and weakness of the left leg and some difficulty in starting the flow of urine. This gradually improved.

On October 20, under nitrous oxide and ether anesthesia, a subacute appendix and a large cystic and degenerated ovary were removed. The surgical progress was uneventful. Numbness and weakness of the left leg continued for several weeks, with absent knee and ankle jerk. This gradually improved. By the middle of December, she was able to walk quite normally except for a slight limp of her left leg and some numbness of the left foot. Marked constipation was present. During the last week in December, she developed considerable low back pain and her left leg gradually became weaker. Dr. Mears reported that examination on January 8, 1942, revealed that the left leg was hypotonic, the knee and ankle jerks absent, and there was impaired tactile, pain and temperature sense of the entire leg. In the right leg, knee and ankle jerk were moderately increased, sensation normal.

On January 30, she sustained a third degree burn over her sacral region, without any pain or discomfort. The weakness in her left leg gradually became more pronounced and she again developed difficulty in starting her urine. At about this time, involuntary contractions of the muscles of her left leg were observed. She stated that her right leg felt and functioned normally. Examination on February 10, 1942, revealed a well-nourished female, pulse 100, temperature normal. All cranial nerves were normal; upper extremities were negative except for a fine tremor, some cyanosis and hyperhidrosis of both hands. The upper abdominal reflexes were normal; lower were absent. The Romberg test was positive. She walked with a marked limp. The right leg was somewhat spastic, knee and ankle jerks increased, Babinski positive, no clonus. The left leg was hypotonic, muscle strength somewhat decreased, definite ataxia, absent knee and ankle jerks, no plantal response, no nerve trunk tenderness or vasomotor or trophic changes. Occasional involuntary muscular contractions occurred. Sensation was normal over the face, both upper extremities and the trunk to a level of the eleventh dorsal segment. Over the remainder of the trunk, tactile, pain and temperature sense were impaired. Over the entire right leg, tactile, pain and temperature sense were impaired; position and vibration sense were normal. Over the entire left leg all forms of sensation were lost. There was a third degree sloughing burn over the sacrum.

Her urine was normal except for a few pus cells, hemoglobin 84 per cent; red blood count 4,700,000; leukocytes 8,200; blood pressure 120 systolic; 70 diastolic; blood Wassermann negative. On February 11, 1942, a spinal puncture in the recumbent posture was attemped, but no fluid obtained. In the sitting posture, the spinal fluid was under decreased pressure, with a definite bloc. Eight drops were obtained in two minutes. The fluid was clear, slightly yellowish; the Wassermann was negative. She was discharged from the hospital on February 21, 1942, and readmitted on March 16, 1942. During the interval, her symptoms had increased, she was unable to walk, had great difficulty in voiding, the involuntary contractions in both legs had become so pronounced that occasionally her left knee would strike the abdomen. The right leg had become very spastic, with a definite patellar and ankleclonus, and her sensory level at this time had risen to the eighth dorsal segment. The sloughing area over the sacrum was healing satisfactorily. Five drops of clear, xanthochromic spinal fluid were obtained by spinal puncture, in the sitting posture. This coagulated spontaneously.

On March 24, 1942, Dr. H. O. Peterson, roentgenologist, injected 4 c.c. of lipiodol in the third lumbar interspace, and reported the characteristic changes described in arachnoiditis (Fig. 1). An attempt was made

to remove the lipiodol by the Kubik and Hampton[29] method but only 2 c.c. were obtained. The remainder was infiltrated between the adhesions and could not be removed. The patient was discharged from the hospital on March 26, 1942, without any change in the

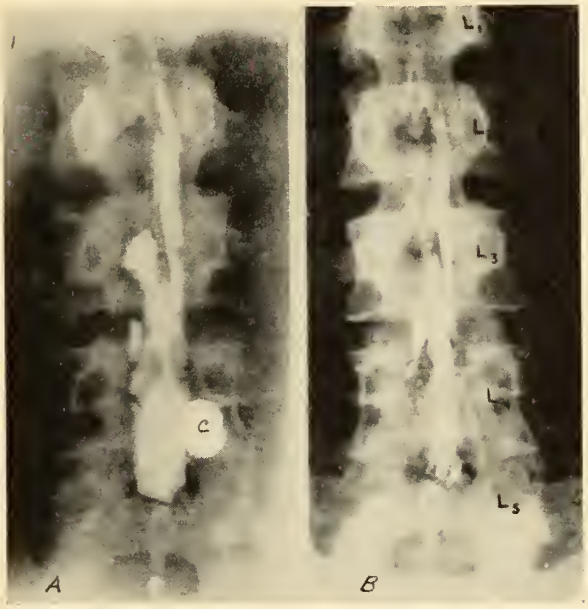


Fig. 1. Lipiodol Myelography: 4 c.c. injected at third lumbar interspace.
A. The outline of the canal at the level of the fifth lumbar vertebra is slightly irregular but there is no obstruction. There is complete obstruction to the flow of the lipiodol at the level of the second lumbar vertebra. The obstructed end is very irregular with the obstruction being most marked on the right side, where it begins at the level of the third lumbar vertebra. The appearance is fairly characteristic of the changes described in arachnoiditis with marked adhesions and obliteration of the subarachnoid space. *B.* Myelogram after removal of 2 c.c. lipiodol (Kubich-Hampton method). The remainder was infiltrated between the adhesions and could not be removed. *C.* Spinal puncture needle.

clinical syndrome, and without any apparent reaction from the lipiodol injection. On May 15, 1942, she was operated on by Dr. G. S. Baker, Mayo Clinic, who kindly submitted the following report:

"There was complete anesthesia for all forms of stimuli below the 8th thoracic segment and we were unable to obtain any cerebrospinal fluid, as the lumbar spinal canal was entirely dry. The spines and laminæ of the 7th, 8th and 9th thoracic vertebræ were removed and when the dura was opened we found that it was quite adherent to the arachnoid, and the cord itself, for the entire distance which we explored. Adhesions had formed all about the cord tissue. A small specimen of the arachnoid was removed for pathologic diagnosis and the tissue showed chronic fibrous arachnoiditis, with evidence of old blood pigment in the tissue."

Dr. Baker suggested that it is quite possible that the patient had an intraspinal hemorrhage which could account for the entire syndrome. At the time of her discharge there was no change from the preoperative findings.

A report received from Dr. Mears, July 1, 1942, stated that her condition has remained stationary.

Another case of chronic arachnoiditis was observed a few months ago in a patient seventy-one years old. He had a prostatectomy under metacaine spinal anesthesia, and developed a similar clinical picture and spinal fluid findings as the above case. However, his symptoms developed quite rapidly for forty-eight hours postoperative, after which time they became stationary.

In all probability in these two cases, inflammatory and fibrotic changes developed in the meninges of the spinal cord, due to the anesthetic, as has been demonstrated by Davis[10] and Haven.[14] An extension of this process with subsequent involvement of the spinal circulation readily explains the clinical syndrome, manifested as a slowly ascending myelitis.

Brain and Russell[6] reported a somewhat similar case following spinocaine anesthesia. The spinal fluid was normal eight weeks postoperative. He died sixteen weeks later and pathologic examination revealed a massive softening of the spinal cord, up to the twelfth thoracic segment, with inflammatory reaction in the pia, and perivascular changes. In Brock's[7] case, the patient presented a cauda equina neuritis following spinal anesthesia. During the next twenty-nine months a transverse myelitis and radiculitis developed which ultimately proved fatal. The clinical course was characterized by long periods during which the condition was stationary. With subsequent exacerbations, higher levels of the cord became involved. He suggests that the original chemotoxic effect on the spinal cord, by the anesthetic, may have devitalized the neural tissue so that other factors, such as a dormant virus, may become active and cause further involvement.

Case 6 (Toxic psychosis).—M. F., male, aged sixty one, was referred by Dr. C. J. Glaspel of Grafton, North Dakota, on May 9, 1942. On March 28 1942, the patient developed recurrent attacks of lower right abdominal pain. He consulted his physician during the night of March 31, 1942, and was operated upon the following morning. A ruptured gangrenous appendix was removed and a generalized peritonitis was found. The operation was performed under spinal anesthesia, 2 c.c. of spinocaine in 2 c.c. of spinal fluid in the second lumbar interspace. The patient ran a septic temperature around 102 degrees F. for two weeks with marked abdominal distention. During the first week postoperatively his blood pressure was 180 systolic, —100 diastolic, and since them has been 140 systolic, —90 diastolic. Following his operation he slept for six hours, probably due to a hypodermic of morphine. On awakening he was extremely restless and insisted on getting out of bed. The following day he was confused, disorientated and refused to take liquids

He developed a marked insomnia which was not relieved by sedatives. He appeared quite toxic and developed hallucinations of sight and hearing. He had loss of bladder and rectal control. He gradually developed short periods during which he was less disturbed. He lost about thirty pounds in weight.

Our neurological examination on May 9, 1942, was normal. He was extremely restless, somewhat dehydrated, had hallucinations of sight, would not answer questions, and had involuntary urine and stool. He had to be kept in restraint, and tube feeding was necessary. His temperature was normal; pulse 100. Hemoglobin was 90 per cent; red blood count 4,940,000; leukocytes 13,700; urine normal; blood Wassermann negative. The spinal fluid was clear, pressure 180 m.m. water, no bloc, one cell, Wassermann and colloidal gold curve negative, quantitative protein 45 mg. per 100 c.c. He improved physically, gained in weight, and became somewhat clearer mentally. He continued to have involuntaries and refused to eat. About June 1, 1942, he developed four carbuncles, located around the gluteal region, with some temperature and a leukocytosis of 21,500. The carbuncles continued over a period of one month, with new ones appearing. His mental status gradually changed, his hallucinations subsided and he developed a characteristic Korsakoff's psychosis.* This case presents a typical syndrome of a toxic psychosis secondary to the acute abdominal infection. This would have developed regardless of the type of anesthesia employed.

Summary

Eight cases of neurological complications associated with spinal anesthesia are reported, six of which are described in detail.

Five cases of preoperative organic neurological disorders were aggravated following spinal anesthesia. A complete personal history and a thorough preoperative neurological examination will assist in eliminating this unnecessary risk.

Although no definite conclusions can be drawn as to the causative relationship, these cases definitely demonstrate that the chemotoxic effect of the various spinal anesthetics aggravate preëxisting neurological diseases.

Serious complications in individuals neurologically normal are relatively infrequent and in properly selected cases spinal anesthesia still holds an important place in the surgeon's armamentarium.

*He was discharged from the hospital on August 14, 1942, and returned home. On September 20, 1942, Dr. Glaspell reported that he was slowly improving, but still confused and disinterested.

References

1. Ashworth, H. K.: Nervous sequelæ of spinal anesthesia. Proc. Roy. Soc. Med., 26:501-506, 1933.
2. Barker, A. E.: Clinical experience with spinal analgesia in one hundred cases. Brit. Med. Jour., 1:665-674, 1907.
3. Barrie, H. J.: Meningitis following spinal anesthesia, The Lancet, 240:242-243 (Feb. 22) 1941.
4. Behrend, A., and Riggs, H. E.: Cerebral complications following surgical operation. Arch. Surg., 40:24-42, 1940; also Arch. Surg., 41:772-780, 1940; also Am. Jour. Surg., 53:296-299, 1941.
5. Bigelow, H. J.: Insensibility during surgical operations produced by inhalation. Boston Med. and Surg. Jour., 35: 309, (Nov. 18) 1846.
6. Brain, R., and Russell, D.: Neurological sequelæ of spinal anesthesia. Proc. Roy. Soc. Med., 30:1024-1030, 1937.
7. Brock, S.: Bell, A., and Davidson, C.: Nervous complications following spinal anesthesia. Jour. A.M.A., 106: 441-447, (Feb. 8) 1936.
8. Corning, J. F.: Spinal anesthesia and local medication of the cord. New York Med. Jour., 42:483-485, 1885; *also* Further contribution on local medication of the spinal cord with cases. Med. Record, (March 17), 1888.
9. Critchley, M.: Neurological sequelæ of spinal anesthesia. Proc. Roy. Soc. Med., 30:1007-1012, 1937.
10. Davis, L.: Haven, H., Givens, J. H., and Emmet, J.: Effects of spinal anesthetics on the spinal cord and its membranes. Jour. A.M.A., 97:1781-1785, (Dec. 12) 1931.
11. Ferguson, F. B.: Neurological sequelæ of spinal anesthesia. Proc. Roy. Soc. Med., 30:1020-1024, 1937.
12. Foss, H. L., and Schwalm, J. L.: Relative merits of spinal and ether anesthesia. Jour. A.M.A., 101:1171, (Nov. 25) 1933.
13. Gwathmey, J. T.: Anesthesia. New York: Appleton & Co., 1914.
14. Haven, H.: Discussion on paper by Lundy, J. S., and co-workers.[22]
15. Hayman, I. R., and Wood, P. M.: Abducens nerve paralysis following spinal anesthesia. Ann. Surg., 115:864-868, 1942.
16. Jelliffe, S. E., and White, W. A.: Diseases of the Nervous System, Philadelphia: Lea & Febiger, 1929.
17. Koster, H., and Kasman, L. P.: Histologic studies of the spinal cord following spinal anesthesia. Am. Jour. Surg., 25:277-280, 1934.
18. Kubich, C. S., and Hampton, A. O.: Removal of iodized oil by lumbar puncture. New Eng. Jour. Med., 224:455-457, 1941.
19. Labat, G.: Elimination of dangers of spinal anesthesia. Am. Jour. Surg., 5:625-632, (Dec.) 1928.
20. Light, G., Sweet, W. H., Livingstone, H., and Engel, R.: Neurological changes following spinal anesthesia. Surgery, 7:138-158, (Jan.) 1940.
21. Lindemulder, F. G.: Spinal anesthesia: its effects on the central nervous system. Jour. A.M.A., 99:210-212, (July 16) 1932.
22. Lundy, J. S.: Essex, H. E., and Kernohan, J. W.: Experiments with anesthetics. Jour. A.M.A., 101:1546-1550, (Nov. 11) 1933.
23. Moersch, F. P.: Personal communication.
24. Pitkin, G. P.: Controllable spinal anesthesia. Am. Jour. Surg., 5:537-553, (Dec.) 1928.
25. Simpson, Sir J.: Illustrated London News, (Dec. 4) 1847.
26. Spicer, F. W.: Trauma and Internal Disease. Philadelphia: J. P. Lippincott Co., 1939.
27. Spielmeyer, W.: Pseudosystemerkrankungen des Rückenmarks nach Stovain Anästhesia. Neurol. Centralb., 28: 69-80, (Jan. 16) 1909.
28. Vehrs, G. R.: Spinal Anesthesia, p. 120. St. Louis: C. V. Mosby Co., 1934.
29. Watter, L.: Hemiplegia following spinal anesthesia. Am. Jour. Surg., 53:359-362, 1941.
30. Wilson, S. A. K.: Trauma in etiology of organic and functional nervous disease, Jour. A.M.A., 81:2172, 1923.
31. Young, H. H., and Long, Crawford W.: The pioneer in ether anesthesia. Bull. Hist. Med., 12:191-225, (July) 1942.

TUBERCULOSIS IN WAR TIMES

Fire is fire, no matter what the fuel, but when gasoline is thrown on a flame a dangerous explosion results. Tuberculosis is the same disease now as in peacetime, but war invariably favors a flare-up of tuberculosis and creates new difficulties for those who must combat the blaze. The hard-pressed general practitioner is a seasoned fire-fighter whose aid must be enlisted and whose effort must be supported if smoldering tuberculosis, lately coming under control, is to be prevented from spreading into a serious conflagration. Even veteran firemen, however, periodically examine their equipment and drill themselves to increase their efficiency.

SPINAL ANESTHESIA—IMPORTANT PRINCIPLES

RALPH T. KNIGHT, B.A., M.D., F.A.C.S.

Associate Professor and Director of the Division of Anesthesia
University of Minnesota
Minneapolis, Minnesota

SPINAL anesthesia is one of the most helpful and most successful procedures which has ever been devised in medicine. From its early beginnings with the daring use of one of medicine's most toxic drugs, cocaine, it has been painstakingly developed until now a number of much less toxic drugs are available, which possess such a variation in characteristics as to make possible a very helpful choice for each individual case. Methods and techniques, too, have been improved so that with the proper application of them excellent anesthetic results can be obtained, as needed in each instance, and untoward consequences can be almost certainly avoided. I think one can definitely state that spinal anesthesia is a helpful and not a dangerous procedure, in which, however, one may easily do harm if he neglects or does not understand, certain well-recognized and necessary precautions. The writer believes this statement so completely that three years ago, when confronted with the necessity of having surgery and an anesthetic for himself, he quickly and unhesitatingly chose spinal anesthesia to be administered by an anesthetist who he was sure knew, considered and practiced all of the important details of choice and technique. Metycaine was used because both my anesthetist and myself had had much favorable and no unfavorable experience with it, and because I had been found to be sensitive to procaine. I say this because metycaine has been criticized.

Several of these details need especial emphasis at this time:

1. *The spinal puncture.* Trauma to nerve roots and spinal cord can be best avoided by making a perfect mid-line puncture, "in the middle of the center," as Dr. Lundy is wont to say. To accomplish this the patient must be exactly placed with hips and shoulders exactly perpendicular and the spinal column arched and straightly horizontal. Too often this simplest of principles is imperfectly followed. The needle, after being tested, should then be handled without bending and inserted horizontally, and as slowly as it is possible to make anything move, until its point passes through the resistance of the ligamentum flavum and then of the dura. Needless to say, if the resistance of bone is encountered one must never push but must withdraw the needle to the subcutaneous tissues, re-survey the landmarks and again insert it in a corrected direction. If when thus slowly introduced the needle should touch periosteum or nerve tissue a warning is received before any damage is done. If, however, it is introduced too roughly or too fast it may plunge into periosteum, nerve root, or cord and cause definite trauma.

In the matter of producing successful spinal anesthesia, unless the needle bevel has been introduced completely into the free subarachnoid space so that fluid may be aspirated freely, rapidly, and without hindrance, there is only a remote chance that the injection of the anesthetic solution will bring about the desired anesthesia. There is, however, in such case a definite chance that if injected the solution will be insufficiently diluted with spinal fluid and will cause prolonged or permanent damage to the nerve tissue.

2. *The concentration of the solution injected.* When the needle has been successfully introduced the spinal anesthetic procedure has only just begun. The recognized strengths of the solutions of the various drugs, as they exist in the syringe before injection, and above which one cannot raise them without danger, are as follows: procaine, 5 per cent; metycaine, 5 per cent; pontocaine, 0.5 per cent (1-200); nupercaine, 1-1500. I do not believe one is justified in ever increasing these strengths in the hope of prolonging the working duration of the anesthesia. Each of the drugs is longer in action in the order named and if one is especially anxious for longer duration the continuous or fractional technique is available. I believe there is no doubt that too highly concentrated solutions have caused vastly more cases of nerve damage than has trauma by the needle.

Part of a Symposium on Anesthesia presented at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 30, 1942.

3. *The rate of injection.* This third precaution is a corollary of the second. Many who use spinal anesthesia have felt that they were using caution by injecting the solution very slowly. The reverse is true. When injected slowly the solution remains discrete from the spinal fluid and, if distinctly heavier than spinal fluid as in the case of procaine and metycaine, it rolls rapidly downhill when the patient's head is shifted downward or the Trendelenburg position is assumed within quite some time after the injection. Further, and this is the point we are especially emphasizing in this paragraph, the concentrations mentioned above are themselves definitely high enough to do damage. They can only be used because they are to be diluted immediately with spinal fluid. If, then, by injecting slowly, one avoids this immediate dilution, he invites trouble. My attention has been called to at least one case in which I feel sure this was true. Lundy has for years advocated the injection at the rate of 0.5 c.c. per second, and this method has proven very satisfactory in the hands of all who have used it. Undoubtedly a considerably faster rate can be used with safety.

4. *Control of the height of anesthesia produced.* This is managed by varying the site o finjection, the amount of solution injected, the specific gravity of the solution and the position of the patient after injection. An average dose of procaine or metycaine in 5 per cent solution injected at the rate of 0.5 c.c. per second, if the patient is kept level, will create anesthesia about five segments above the site of injection. If the head of the table is at once lowered slightly the spread will be increased. Pontocaine in 0.5 per cent solution injected in the same way will not spread so far because it is almost exactly the same specific gravity as spinal fluid and the intermixture is therefore less encouraged. Increase of the amount of solution increases the height of anesthesia. Nupercaine, 1-1500, is much lighter than spinal fluid and tends to rise in it. If the patient's head is raised too suddenly or too high or remains up too long, immediately after injection, anesthesia may rise too high and interfere with respiration. On the other hand, the upward position of the head under close observation and management by one with experience may be safely used to control the height of anesthesia to be obtained by the use of nupercaine. Likewise by using the heavier solutions such as procaine or metycaine, or by making pontocaine or nupercaine heavy with added dextrose, one may raise the head and neck on a pillow, lower the shoulders considerably below the pelvis, and thus conveniently produce anesthesia to the fifth thoracic segment. If these maneuvers are not well managed, as they should be, and if, for instance, the Trendelenburg position is invoked too soon or without proper flexion of the head and neck, anesthesia may advance beyond control and cause respiratory arrest by paralyzing all of the intercostals and the diaphragm. Although this attack has advanced well beyond the first lines of defense it need not at all be a tragedy. No stimulants are needed or even beneficial if by some artificial means one keeps air or oxygen exchanging in and out of the lungs until anesthesia recedes and the patient can resume automatic breathing. I doubt whether one is ever justified in doing a spinal anesthesia unless he is equipped with a machine which provides oxygen, a close-fitting mask, and a rebreathing bag with which one can perform artificial respiration, or its equivalent such as a resuscitating machine. If one really knows spinal anesthesia he may go through a lifetime without causing respiratory arrest, but through some little failure on the part of himself or an assistant it might occur. There can be no justification for doing a major procedure of this kind without proper equipment. An emergency necessitating it would be hard to conjure up. Such a death could be due to nothing but neglect.

5. *The control of the blood pressure.* Considerable fall in blood pressure is dangerous, especially in the middle-aged or older group and in those with decompensated hearts, because of the accompanying medullary, cerebral and cardiac hypoxia and tendency to thrombosis. It is combatted by the administration of oxygen, which as stated above, should always be at hand, and which should be liberally used in many cases routinely, and by lowering the head as soon and as much as consistent with the anesthetic injected. The most important control, however, is in the use of the pressor drugs.

In good risk patients a prophylactic dose of 25 to 50 mgm. of ephedrine injected intramuscularly before injecting the spinal anesthetic is usually sufficient to maintain the blood pressure at or near its usual level. If, however, the anesthesia is rather high, a fall of pressure may oc-

cur and must be met by further doses of ephedrine, if necessary, in small units of 10 to 15 mgms. intravenously.

In poorer risks and older people, one must exercise special care to keep the blood pressure at or near its preanesthetic level. If the latter is high, one must not inject a prophylactic dose of ephedrine until he knows that the spinal needle is within the dura and that spinal fluid can be freely aspirated so that he is definitely ready to inject the anesthetic. He then should inject intramuscularly a dose of the pressor drug which he believes will be sufficient to prevent a significant bood pressure fall, and should wait five minutes before completing his spinal anesthetic procedure. Old people with high blood pressures are the very ones who are apt to have spinal arthritis which may delay or even prevent a correct spinal tap. The writer has known of three deaths due to the too optimistic injection of ephedrine before attempting the spinal puncture, or to the injection of too large an amount. The result was a severe and prolonged rise of blood pressure followed by cerebral accident. The prophylactic dose of the pressor drug should therefore be conservative, about 25 mgms. of ephedrine. One should then be prepared to inject a small amount intravenously if the pressure starts to decline. Ten mgms. is enough until one waits with the needle in the vein for one minute or more to see what effect will take place. Additional amounts in units of 5 mgms. can then be added as indicated until the blood pressure has become stabilized.

A most effective combination, and a favorite one with the writer, is a mixture of one mgm. of neosynephrin to 20 mgm. of ephedrine. This is especially helpful for old people to whom one must be careful not to give too much too soon, but must certainly avoid too little and too late. The above amount is a good average initial intramuscular dose. Each intravenous unit should not be more than one-fourth or one-fifth that much. Neosynephrin alone, in doses frequently spoken of, 5 mgms., for example, is dynamite and frequently sends the blood pressure skyrocketing one hundred and fifty points.

The above five points of special precaution are concerned with the dangers attendant upon the administration of spinal anesthesia. This paper must leave unconsidered the details of dosage and technique with the various drugs for producing anesthesia for various surgical procedures.

Neither is sufficient time available to discuss those patients for whom spinal anesthesia should be definitely avoided or seriously questioned. Possibly their number is growing somewhat less as our familiarity with all types and modifications of spinal anesthesia increases. Certainly no patient with a lesion of the spinal cord or with primary anemia should be given spinal anesthesia. One suffering from secondary anemia, hemorrhage, or shock should certainly have those conditions first brought under control. One with cardiac decompensation should not be given spinal anesthesia until all other forms of anesthesia have been carefuly considered and compared in risk in every way and evaluated as carrying at least no less risk than a spinal.

If used with due attention to all the known and recognized factors of safety and proficiency, spinal anesthesia should continue to occupy a high place among the standard and most helpful procedures in medicine.

SMALLPOX VACCINATIONS GIVEN TO 36,000 IN DISTRICT OF COLUMBIA

About 36,000 residents of Washington, D. C., most of them employes of the federal government, have been vaccinated against smallpox since last December, the District of Columbia Health Department announced. About 10,000 of these vaccinations were given by physicians of the health department and the rest by the medical staffs of various federal and District agencies.

The outbreak of smallpox in nearby Pennsylvania stimulated the current vaccination drive, but Dr. George C. Ruhland, health officer of the District of Columbia, is still urging that all persons living there who have never been vaccinated should take this health protection immediately.

The reason is that Washington is the crossroads of the world in war activities. People are coming not only from the entire nation but from all over the world, many of them from regions where vaccination against smallpox is not practiced, and this increases the danger to unvaccinated persons there.

No case of smallpox has been reported in Washington in the past ten years.—*Science News Letter,* March 13, 1943.

NEWER TRENDS IN INTRAVENOUS ANESTHESIA

JOHN S. LUNDY, M.D.
and
EDWARD B. TUOHY, M.D., M.S. (Anes.)
Rochester, Minnesota

The intravenous method of producing general anesthesia has a great appeal to the experienced anesthetist as well as to the surgeon, patient and others. It is increasing in favor because patients who have been anesthetized once in this fashion usually request it when, and if, they must be anesthetized subsequently.

The original technique of giving large doses of the anesthetic agent and withdrawing the needle has been abandoned in favor of intermittent injections of doses that are safe but sufficient. The principle of this technique of injection is not fundamentally different from that of the administration of ether by the open drop method. With both procedures the anesthetic agent is given if, and when, and in whatever quantity it is needed.

The use of a 5 or 10 per cent solution of the anesthetic agent has been abandoned and at present a 2.5 per cent solution is used so that the untoward results from extravenous injections are no longer seen.

Various devices have been designed so that one person simultaneously may administer the intravenous anesthetic agent, maintain an adequate airway for the patient and, if necessary, administer a gaseous anesthetic agent by inhalation.

Use of intravenous anesthesia as a part of balanced anesthesia has been the latest trend in the use of the method. Preliminary medication is essential to the optimal application of intravenous anesthesia. The usual preoperative medication for the average adult is 1½ grains (0.1 gm.) of pentobarbital sodium (Nembutal) by mouth at bedtime the night before the operation; this dose is repeated the first thing in the morning, when the patient awakens, or at 7 a.m. In addition, 1/6 grain (0.01 gm.) of morphine sulfate and 1/150 grain (0.00043 gm.) of atrophine sulfate are given about forty minutes before operation. Local, regional or spinal anesthesia is employed together with intravenous anesthesia with pentothal sodium at the same time that a mixture of 50 per cent nitrous oxide and 50 per cent oxygen is administered by inhalation. This form of balanced anesthesia has certain demonstrable advantages. The preliminary medication brings the patient to the operating room in a placid condition. The administration of a local anesthetic agent can be carried out either before or after the induction of anesthesia by the intravenous administration of pentothal sodium. The convulsant effect of an overdose of the local anesthetic agent is largely counteracted by the preoperative administration of a barbiturate and the intravenous administration of pentothal sodium. Pain of injection of the local anesthetic agent is neutralized by the analgesic effect of morphine plus the anesthetic effect of pentothal sodium. The preoperative administration of atropine results, among other things, in drying secretions and little or no accumulation of foreign material in the oropharynx. It also tends to prevent laryngospasm which may develop readily because pentothal sodium is a thiobarbiturate and seems to increase the activity of the throat reflexes. In cases in which intravenous anesthesia is to be used for manipulation within the throat, a local surface anesthetic agent, such as cocaine, must be applied just as should be done if the manipulation, bronchoscopy for example, were to be done with the patient under local anesthesia only. Because in deep surgical anesthesia with pentothal sodium respiration is depressed markedly, at first it was found necessary to give oxygen also. Later it was found that a combination of 50 per cent nitrous oxide and 50 per cent oxygen was just as effective in supplying the patient with oxygen and definitely decreased the amount of pentothal sodium that was necessary.

A point of special value to remember when pentothal sodium is to be administered with a spinal anesthetic agent is that the spinal anesthetic agent produces intercostal paralysis, the pentothal sodium central paralysis and the result is extraordinarily quiet respiration. The adminis-

From the Section on Anesthesia, The Mayo Clinic, Rochester, Minnesota. Part of a Symposium on Anesthesia presented at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 30, 1942. This paper was prepared before May 25, 1942, when Dr. E. B. Tuohy entered the service.

tration of a combination of oxygen and nitrous oxide, half and half, reduces the dose of pentothal sodium enough so that respiration remains adequate. When this combination of pentothal sodium given intravenously and a mixture of half nitrous oxide and half oxygen by inhalation is used, it is important that these general anesthetic agents are not administered for at least fifteen or twenty minutes after the spinal anesthetic agent has been administered and that determinations of blood pressure are made at frequent intervals while this type of anesthesia is maintained.

Because of the relative suddenness with which an untoward result may develop, pentothal sodium is seldom used for the preoperative prediction of the probable result of sympathectomy on hypertensive patients. The use of divided doses of sodium amytal by mouth can give practically the same information although the test requires a longer period of time with sodium amytal than with pentothal sodium. However, pentothal sodium given intravenously in small doses (7 to 10 c.c. of a 2.5 per cent solution) before inhalation anesthetic agents are administered has proved advantageous for hypertensive patients. There is little change, however, in the contraindications to the use of pentothal sodium: it should not be used for children less than ten years of age unless they are large and 50 per cent oxygen and 50 per cent nitrous oxide is administered simultaneously, for patients who have cardiac disease and decompensation, nor for patients in marked shock especially when it is due to marked loss of blood.

The use of pentothal sodium in doses sufficient only to produce light surgical anesthesia for such operations as extraction of teeth has been described by Hubbell and in time may be used widely.

Barbiturates given intravenously have not produced satisfactory anesthesia for normal deliveries but have been satisfactory for cesarean section when given in association with local anesthetic agents. The most satisfactory procedure has been about as follows: The line of incision is infiltrated with a local anesthetic agent and incision is made through the abdominal wall. The intravenous anesthetic agent is administered just before the incision is made through the uterine wall. The result is general anesthesia for the mother and no anesthesia for the child. The child's breathing is spontaneous as soon as the head is delivered from the uterus.

The art of venipuncture is being mastered by those who would use pentothal sodium to induce anesthesia since it is not possible to use this agent for anesthesia if venipuncture cannot be performed. The application of heat to the extremities before venipuncture expedites the procedure.

The use of pentothal sodium instead of ether as an auxillary agent to reinforce anesthesia with nitrous oxide and oxygen permits a technique which is fireproof and has been of decided advantage in many procedures when a fireproof method was necessary and general anesthesia was desired.

The intravenous method of anesthesia is still in the early stage of development. We expect the method to be used more and more widely, especially if better agents can be obtained or if investigation of older agents reveals applicability to this method.

AEROPHAGIA

G. HOYME, M.D.
Eau Claire, Wisconsin

MUCH has been written concering aerophagia and its treatment by authorities too numerous to mention. My interest in the subject was kindled after several months of postgraduate study in the clinic of B. W. Sippy, and my purpose today is to present in brief an epitome of only the bare requisite essentials.

Eighty per cent of my patients with gastro-intestinal disturbances have symptoms of abdominal fullness, gas and belching. These may be brought on or intensified by aerophagia, which is a self-induced method for the so-called removal of "gas." The treatment of this condition has varied from placing a cork between the teeth to the latest suggestion whereby the patient is taught "to swallow properly by closing the lips, sucking in

Presented before the Minnesota Society of Internal Medicine, Duluth, Minnesota, May 23, 1942, and the American Therapeutic Society, Atlantic City, New Jersey, June, 1942.

the cheeks and pressing the tongue against the roof of the mouth before swallowing, whether he is taking food, liquids, or merely saliva. The patient is also instructed to make a water seal with his upper lip on the glass when drinking liquids in order to prevent the intake of air above the fluid."

An appreciation of the ill effects of aerophagia and its rational treatment is suggested while considering thoroughly the mechanism of its production. Note first that in most abdominal disorders, however remote, the chief symptom is a sensation of fullness in the epigastrium. This distress signal is interpreted by the patient as "gas on the stomach," calling for action to open an avenue for its escape. This is the origin of belching. Second, it can be dogmatically stated that true gas in the stomach exists only in the presence of pyloric obstruction and increased acid values after hours of fermentation, or following the introduction of an alkali such as Seidlitz powder to an acid medium which forms CO_2. Third, it is important to realize that air is introduced into the stomach normally with each swallow of saliva, food or fluids, the amount accumulated after a meal or drink expanding into a sizable bubble located above the food or fluid level. This is shortly and quite spontaneously eructated or "burped." This phenomenon is best observed during gastric fluoroscopy.

The unnatural introduction or inflation of the stomach with air is due to many and various causes. The most conspicuous examples of inducing aerophagia are exemplified by the infant, breast or bottle fed, which sucks air with its feeding; the youth who discovers that he can accumulate sufficient air by belching to utter weird sounds or guttural sentences; the flighty, nervous, or hysterical individual who uses this means in order to impress its sounds and other effects for the purpose of creating sympathy. Associated with these cases is the complaint of globus. Among individuals with "globus hystericus," it is the desire of the patient to force the "lump in the throat" downward with greater attempts at swallowing than the effortless normal deglutition. The result is a large air bubble in the stomach which is later used in an effort to move the obstruction upward by belching. A vicious circle is created which causes the phantom tumor to persist. Thus two methods of introducing air are demonstrated—the effort swallow, and air suction or belching.

There is a large group of distressed individuals who suffer the effects of belching associated with various gastro-intestinal lesions such as gallbladder disease, and most notably, the functional or irritable colon. Cardiac irregularities, coronary disease, renal and even pelvic disease are conducive to aerophagia. A veteran belcher with a glass of barium behind a fluoroscope demonstrates best the mechanism of aerophagia. One observes first the small air bubbles that follow each other down the esophagus to form the usual gastric air bubble immediately above the food or fluid level; then as the patient is instructed to rid himself of the "gas," action commences. A sucking act starts extra large air bubbles on their downward course which inflate the stomach to an astounding degree, often to twice the amount of ingested barium. Usually after the fifth or sixth effort, air is released and personal satisfaction as to sound effect, volume of gas, and relief is accomplished.

The following symptoms are experienced during the act of belching when the stomach has attained an unusually large size: epigastric fullness, pain, dyspnea to the point where the patient often must sit up in bed and wild-eyed, wonder whence the next breath is to come; palpitation and frequently premature contractions are instigated. The gastric distention also causes marked embarrassment to a decompensated heart, vertigo, hazy vision, dull headache, the frequently described sensation of expansion in the size of the head, numbness, and tingling. Heartburn is noticed because of regurgitated air and stomach contents. The eructation is due to slushing particles of food pitched through a relaxed cardiac valve into the esophagus and mouth.

Deflation brings temporary but grateful relief, usually for half an hour, then the feeling of "gas on the stomach" returns and with it the persistent belching. The false feeling of relief brought about by the relaxation of the overdistended muscular wall of the viscus encourages the repetition of this illogical procedure. When air thus introduced is not expelled via the mouth, it enters the small intestine and by peristalsis is propelled to the colon with consequent colicky pain.

Successful treatment of this baneful symptom calls for a thorough search for the underlying cause and its correction; then of significant importance is the careful explanation of the mechanism of aerophagia, augmented by its graphic description. Belching is a habit and the treat-

ment for the persistent desire to belch is further enhanced by instructing the patient to take five or six deep breaths instead of belching. Sedatives and heat to the epigastrium are indispensable. My results with this method of treatment when dealing with intelligent patients have been gratifying and I recommend its use above all other less effective methods such as a cork between the teeth and abnormal swallowing.

In conclusion, an appeal should be made to the common sense of the patient by a simple explanation and graphic demonstration of the mechanism of aerophagia.

THE DOCTOR OF MEDICINE AND HIS RESPONSIBILITY

ALFRED W. ADSON, M.D.
Rochester, Minnesota

MEMBERS of the North Central Medical Conference, representing the states of North Dakota, South Dakota, Minnesota, Wisconsin, Nebraska, and Iowa, have entrusted me with the responsibility of addressing this National Conference on Medical Service concerning medical problems that are of both local and national interest.

It is the duty of every doctor of medicine to prevent illness, to supply adequate medical care to those who are ill, to perpetuate the science of medicine and to encourage medical investigation. It is true that the average physician would prefer to go unregimented among his sick and administer to their needs, irrespective of race, color, creed, or financial status, rather than busy himself with administrative and political problems. However, since the courts have ruled that group health is a business and have found that medical societies are guilty of restraining trade when attempting to maintain the standards of the practice of medicine, a challenge has been issued to the medical profession: Is there a necessity for lay groups and the Federal Government to take over the control of the practice of medicine?

Has the science of medicine reached its zenith? Have the men and women of medicine become so decadent that they are unable to assume their responsibilities? Are the doctors of medicine no longer able to conduct their practice without government control? Do they lack ability to appreciate their problems? Or are they incapable of constructive leadership in the solution of the numerous responsibilities that are confronting the medical profession today? The reply is, "No."

The science of medicine has been nurtured by men and women who have advanced the knowledge of relieving pain, correcting deformities, lowering infant mortality, prolonging life and preventing illness by sanitary and public health measures. This progress must continue if civilization is to survive.

The medical profession is conscious of social and economic changes and stands ready to cooperate with, and offer leadership to, state and federal agencies in the solution of medical problems. It further believes that better medical service can be rendered by offering advice and leadership to welfare agencies than by serving as a tool under political bureaus.

The medical profession recognizes the necessity of state and federal control of communicable diseases and medical services to inmates of state and federal institutions. It appreciates its responsibility to the Armed Forces and expects to supply the needed personnel. It is willing to coöperate with welfare agencies in providing adequate medical care for the low-income and indigent groups of the population; but in providing this care, it believes that the medical service is augmented when the patient-physician relationship can be maintained by permitting the patient, whenever possible, to choose his own physician. In order to protect the public from worthless, so-called medical procedures and unnecessary operations by unscrupulous individuals, it likewise believes that high standards of medical education and practice must be maintained. This applies not only to the practice of medicine in the office; it applies to the practice of medicine in the humble home or in the most modern hospital.

Although medical education begins in the medical school, it is never completed as long as the physician continues his practice. Medical schools have adopted standards of education and have

Read at the meeting of the National Conference on Medical Service, Chicago, Illinois, February 14, 1943.

required certain courses of study in order that the public might avail itself of the best practices of medicine. Medical licensing boards have further protected the public by requiring of their candidates for licensure prescribed courses of study. State laws governing the practice of medicine and conduct of physicians further protect the public from irregular practices and charlatans.

Medical societies, county, state, and national, have been organized to further the education of the physician by acquainting him with the advances and new discoveries in the science of medicine. They likewise serve as administrative units in the consideration and solution of medical problems. It is obvious that the responsibilities of the respective state organizations are greater than those of the county organizations, and that the national organization is charged with greater responsibilities than those of the state organizations. However, it is also obvious that the activities of all groups must be integrated if medical problems are to be solved effectively. In some states, such as Minnesota, the administrative and the legislative bodies have the confidence of the medical profession. Likewise the medical profession has the confidence of the state administrative and legislative bodies. This confidence has made it possible for representatives of both groups to attack and solve the medical problems which are of mutual interest.

The national organization, through its respective bodies and committees, has conducted an excellent program in furthering medical education. It has crystallized the standards of medical education for the medical student as well as for the practitioner of medicine; it has investigated the claims of new and nonofficial remedies, foods and therapeutic measures and has further protected the public by approval or disapproval of the articles investigated. It has taken active steps through its Procurement and Assignment Committee in providing medical men for the Armed Forces without robbing communities of adequate medical personnel and has made provisions for relocation of physicians where more medical service is needed. It has acquainted the public with the important role that the science of medicine plays in their daily lives, but apparently it has not gained the confidence of the national administrative and legislative bodies that some of the state medical societies have attained. The National Physicians' Committee has made some progress in acquainting the public with the necessity of medical science, but it too had not obtained the confidence of the national administrative and legislative branches of our Government. Therefore, the recent court decision has emphasized the weakness of the educational program so far conducted for the purpose of acquainting the public, the administrative and legislative bodies of certain states, and the national institutions with the important function of the science of medicine in our civilization. It is our duty, as physicians and citizens, to assure those in administrative positions and legislative bodies that we are familiar with the social and economic changes that have thrown greater responsibilities on the medical profession and that we stand ready to coöperate with these agencies in offering leadership in the solution of the numerous problems which nonmedical personnel are trying to solve.

The chief medical problem that concerns doctors of medicine and welfare agencies is that of providing adequate medical care to those who are financially unable to procure this care. This group includes those who are indigent and those with low incomes. Medical care, in its true sense, embraces more than emergency treatment for a particular illness, since it should include a rehabilitation program, such as the correction of deformities and ailments that impair the efficiency of individuals. The rehabilitation program also should include adequate and proper diets, physical training, recreation, protective clothing and housing. In most of the cities the indigent are provided with proper medical care through the charity hospitals, where competent physicians give of their services. This same group in the rural districts is not always so fortunate, since local welfare boards are reluctant to provide this care. It is in these situations that the physicians have been overburdened in assuming all of the responsibilities in providing the necessary medical care. Prior to the more recent economic changes, physicians were willing to assume this obligation because those who could afford to pay for professional services attempted to meet their obligations. However, as a result of the recent social and economic changes, the Government has taken over more and more control of the civilian's activities, and those with moderate and low incomes have been less willing to assume their ob-

ligations of medical care and are insisting that it is the Government's duty to provide medical care and that it is the individual's privilege to squander his extra change.

The problems of this group cannot be solved by physicians alone or by federal, state, and local welfare agencies alone. Ours is a joint responsibility. Conscientious leadership by physicians working in coöperation with county, state and federal agencies can and will bring forth a solution of the problem. Medical service must be rendered, and the physician is willing to give a good portion of his services. But the Government must provide reasonable funds for the care of its indigent, as it must provide for catastrophic illness in the low-income group. Nevertheless, those who come within the low-income group should likewise be made to realize that they too owe a responsibility to their local, state and federal governments and should be encouraged and advised in budgeting their income and expense.

Industrial compensation has accomplished much in providing proper medical care and the necessities of life, during illness, for those employed in industrial institutions. However, there still remains a large group of individuals who receive moderate or low incomes and are desirous of securing the assurance of adequate medical service in the event of illness. Insurance companies have offered this protection through policies covering accident and illness disabilities, but again this protection only partially solves the problem, since many an insuree expects more for his premium than the insurer is able to give. In several states medical societies have attempted to develop medical service plans whereby the insuree may purchase from the doctors within the group full medical protection or medical protection for unexpected, serious illnesses. In some states under the farm security program, experimental medical service plans are being tested out by use in an attempt to find the solution of the problem of supplying medical care to the farmers and their families who are being rehabilitated. In some instances physicians are hired to render medical service to indigent and coöperative groups. Even though physicians, welfare agencies and low-income groups are struggling with the problems of medical service plans, as yet a satisfactory plan for all classes has not been developed. The recipients expect more than the vendors can supply for the premiums paid.

These controversies give rise to discussions on the necessity of compulsory medical insurance. Should such a program evolve, results would be disappointing from the patient's as well as the physician's point of view, because probably the system would be placed under the control of political bureaus, and the patient would be deprived of his free choice of physician.

Therefore, we as physicians believe that a more equitable solution of the perplexing medical problems referred to will be reached if we are permitted to consult and advise administrative officials, legislative bodies, and welfare agencies, since we are more familiar with the medical needs of our respective communities than are those who have a casual knowledge of the medical necessities.

It is befitting to quote the statement found in the opinion written by Justice Miller, of the United States Court of Appeals, of the District of Columbia, in the case of the United States of America versus the American Medical Association, and the case of the United States of America versus the Medical Society of the District of Columbia. The italics are mine.

> It may be regrettable that Congress chose to take over in the Sherman Act the common-law concept of trade, at least to the extent of including therein the practice of medicine. Developments which have taken place during recent decades in the building up of standards of professional education and licensure, together with self-imposed standards of discipline and professional ethics, have, in the belief of many persons, resulted in substantial differences between professional practices and the generally accepted methods of trade and business. As we pointed out in our earlier decision, the American Medical Association and other local medical associations have undoubtedly made a profound contribution to this development. *However, our task is not to legislate or declare policy in such matters, but, rather, to interpret and apply standards and policies which have been declared by the legislature. That Congress did use the common-law test there is no doubt. That Congress was not otherwise advised was perhaps because of the failure of the professional groups to insist upon the distinction and to secure its legislative recognition.*

Does the medical profession of this country need a stronger invitation, or a more direct challenge, to take an intelligent, helpful and fair stand in the enactment of legislation that not only concerns the public welfare but the welfare of medicine itself? Does not the medical profession of this country, as citizens and taxpayers, have a right to express its opinion in these matters before legislation is enacted and rules and regula-

tions are adopted by some bureau? I do not share the opinion that the time for the medical profession to speak up is after such things have taken place. Neither do I have the opinion that Congress would be resentful of intelligent, courageous and fair advice on such matters. What better proof can be asked than the quotation from Justice Miller's opinion that the Court is not responsible for the absence of advice from the medical profession when Congress is drafting a law.

It is not the purpose of this paper to criticize the efforts of our national medical organization nor to criticize the efforts of the National Physicians' Committee, but it is the desire of the members of the North Central Medical Conference to express a wish that a more active program be conducted to acquaint the public, government officials, and legislative bodies with the necessity of medical science and the important rôle it plays in our civilization. It is essential that we as physicians dispel the fear that government administrative agencies and legislative bodies have of our medical organizations and that they be assured of our coöperation in solving the social and economic problems that confront us as a nation.

The functions of acquainting the public on matters of medical interest, assisting bureaus in formulating plans on medical care and offering constructive advice on proposed medical legislation rightfully belong to the national organization known as the American Medical Association. They could be assigned to the National Physicians' Committee, or they might even be undertaken by unifying the activities of the various state committees on public policy and legislation. Representative committees could be appointed for each of the component societies, county, state, and national. These could all be so integrated that national opinion and advice could be obtained and made available for committee hearings on legislation within a few hours' time. Through the national, state, and county committees the entire profession could be informed of proposed medical legislation. Thus, the local constituents of the respective state and federal legislators could express their views before legislation is enacted. Some states already have medical advisory committees from each county. They also have state medical committees on public policy with a physician as part-time executive chairman assisted by legal counsel. A national committee constructed on the same plan as these state committees would have to be created. A physician who has practiced medicine should be chosen as the executive chairman. Both he and his legal counsel would need to be stationed in our national capital. The expense of the national committee on public policy could be financed by one of three agencies, the American Medical Association, the National Physicians' Committee, or the respective state organizations bearing the expense jointly. It would appear more equitable if each physician would be assessed each year for the specific purpose of maintaining a national committee on public policy and legislation.

Our problems are not unlike those of dentists and hospital associations. Therefore, unified effort of medical, dental and hospital associations should further the welfare of the patient.

OBSTETRIC HEMORRHAGE

ARTHUR B. HUNT, M.D.
Rochester, Minnesota

MINNESOTA has always presented an enviable record in its maternal mortality statistics, and yet has shared proportionally in the recent striking decrease in the maternal mortality rate which began in about the year 1933. However, in Minnesota, the rate of maternal deaths from obstetric hemorrhage has, with minor fluctuations, remained practically constant, whereas sharp reductions have taken place in the other two common causes of death; namely, sepsis and toxemia. In Figure 1 this trend is shown in graphic form. The figure records dramatically the unprecedented situation in Minnesota in respect to deaths from hemorrhage, such deaths actually being very slightly in excess of the other two causes in 1941.

The national picture is much the same; that

Included in this paper under this title are only the hemorrhages of the last trimester of pregnancy and intrapartum and postpartum hemorrhage. From the Section on Obstetrics and Gynecology, The Mayo Clinic, Rochester, Minnesota. Read before the meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 30 to July 1, 1942.

is, there has been a small and apparently definite decrease in the number of maternal deaths from hemorrhage, but the decrease is not proportional to the decrease in the number of fatalities arising from sepsis and the toxemias (Table I). The situation may be even more unfavorable than statistics would imply, for it is commonly known that many deaths caused by obstetric hemorrhage are ambiguously reported as deaths by various other titles.

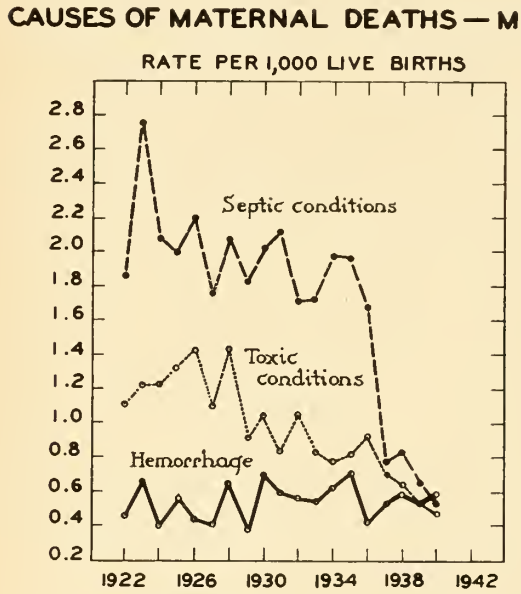


Fig. 1. Graphic representation of maternal deaths in Minnesota in the past two decades (From: Some studies of the results in obstetric and pediatric practice in Minnesota. Division of Child Hygiene, Department of Health, State of Minnesota. Viktor O. Wilson, M.D., director).

Many factors are mentioned as causative of the recent gratifying decrease in the maternal mortality rate. Some of these factors, such as an increase in the number of all confinements attended by physicians, an increase in hospitalization and better obstetric education, should have had a beneficial effect on obstetric risk from the standpoint of hemorrhage, but apparently such is not the case. There has also been a great improvement and simplification in the technic of transfusion. More satisfactory blood substitutes are also rapidly becoming available. In other words, agencies and technics for the reduction of the maternal mortality rate arising from hemorrhage seem to be increasingly at hand, but as yet have had no appreciable effect. It therefore seems timely again to discuss this common obstetric subject and also to suggest that attention now be focused on deaths arising from hemorrhage so that the recent gratifying decrease in the maternal mortality rate can be further accelerated.

TABLE I. TRENDS IN MATERNAL DEATHS*

Death, Causes of	Minnesota: Maternal deaths yearly, mean number		United States: Improvement in recent period, Per Cent	
	1922–34	1935–40	1922–34	1935–40
Hemorrhage	26	27	–4	12
Septic conditions	101	51	50	24
Toxic conditions	56	33	41	32
All other conditions	71	49	31	24
Total	254	160	37	25

*Data from study of results of obstetric and pediatric practice in Minnesota, Department of Health, Division of Child Hygiene, Dr. Viktor O. Wilson, director.

Material

As a basis for later discussion I shall present a somewhat detailed review of the cases of hemorrhage during late pregnancy in which the patients have been seen in the last ten years in the Section on Obstetrics and Gynecology of the Mayo Clinic. The service is not a large one; there were 5,207 deliveries in the years from 1932 to 1941, inclusive.

About 150 cases that had been tabulated as "hemorrhage of pregnancy" were discarded because, after detailed review of the record in each case, hemorrhage which assumed real clinical importance did not seem to have been present, although no doubt the loss of blood in most cases was in excess of normal limits. There remained 344 cases of true obstetric hemorrhage, or an incidence of 6.6 per cent. In these 344 cases the diagnoses were: placenta prævia, fifty cases (Table II); abruptio placentæ, thirty-five cases (Table III); postpartum hemorrhage, 227 cases (Table IV); and thirty-two miscellaneous cases of hemorrhage (Table V).

Maternal Mortality

There were two maternal deaths in this series: one in 1933 and one in 1936. Both patients died of sepsis rather than of exsanguination. The first patient, a forty-two-year-old primigravida, had bled on several occasions before her admis-

sion to the clinic at thirty-six weeks' gestation. Vaginal examination revealed central placenta prævia. A premature infant weighing 2,340 gm. was delivered by classical cesarean section. The infant survived. The mother died of generalized peritonitis on the fourth postpartum day, after a postoperative course typical of this condition. Necropsy substantiated this diagnosis. The value for hemoglobin twenty-four hours postpartum was 11.7 gm. (77 per cent). The second patient, an octipara thirty-nine years old, was admitted to the clinic, in labor and near term, because of suspected multiple pregnancy or pregnancy complicated by a large ovarian cyst. Before this patient's admission, combined abdominal-vaginal examination had been performed in an attempt to engage a fetal head presenting over the inlet. Roentgenologic examination of the abdomen revealed triplets, with the presenting fetus in vertex presentation and the other two presenting by the breech. Labor was allowed to progress, and after complete dilatation the first baby was delivered spontaneously and the other two by breech extraction. All three infants survived. Severe postpartum hemorrhage occurred very shortly after delivery of the last infant, and since the placenta could not be expressed either by simple expression or by Credé's method carried out vigorously, it was removed manually. The value for hemoglobin reached a low of 5.2 gm. (34 per cent) on the third day, but after blood had been transfused was 8.0 gm. (53 per cent) on the eighth day postpartum. Typical puerperal sepsis developed and the patient died of this condition on the twelfth postpartum day. The pathologic diagnosis at necropsy was "acute endometritis and bronchopneumonia." Both these patients were delivered before the advent of chemotherapy.

TABLE II. TREATMENT OF PLACENTA PRÆVIA AND METHOD OF DELIVERY.
50 cases*

Treatment	Cases	Delivery, type	Cases
None required	3	Spontaneous	22
Rupture of membranes	15	Breech extraction	1
Breech extraction	1	Low forceps	3
Willett's forceps	0	Version and breech extraction	6
Bag	11	Cesarean section	18
Braxton Hicks version	2		
Cesarean section	18		
Total	50	Total	50

*Fetal mortality rate: crude, 13 deaths or 24.5 per cent; corrected, 5 deaths or 9.4 per cent (based on 53 infants born to 50 mothers). When the fetal mortality rate is based on 13 deaths of infants in 50 deliveries (50 mothers), the crude infant mortality rate is 26 per cent and the corrected rate is 10 per cent.

TABLE III. TREATMENT OF ABRUPTIO PLACENTA AND METHOD OF DELIVERY
35 Cases*†

Age	Cases	Parity	Cases	Treatment, obstetric	Cases	Delivery, type	Cases	Hemorrhage	
								Grade	Cases
20–25	5	0	10	None needed	17	Spontaneous	28	1	16
25–30	14	1	9	Rupture of membranes	13	Low forceps	2	2	10
30–35	7	2	3	Bag	1	Breech extraction	1	3	6
35–40	6	3	3	Cesarean section	4	Cesarean section	4	4	3
40–45	1	4	4	Total	35	Total	35	Total	35
45–50	2	5	1						
		6+	5						

*Fetal mortality rate: crude, 17 deaths or 48.6 per cent; corrected, 5 deaths or 14.3 per cent (based on 35 infants born to 35 mothers).
†Toxemia present, 18 cases; absent, 17 cases.

Fetal Mortality

The fetal mortality rate was not calculated in detail for the 344 patients who had postpartum hemorrhage, because this type of hemorrhage in itself does not materially influence the fetal mortality rate and because, among the patients who

TABLE IV. GRADE OF HEMORRHAGE, VALUES FOR HEMOGLOBIN AND TREATMENT

227 cases of postpartum hemorrhage

Hemorrhage, grade	Cases	Treatment, ergonovine*		Cases
1	117	How given not specified		28
2	95	Intramuscularly		3
3	15	Intravenously		32
4 (fatal)	0	Intravenously and intramuscularly		10
Total	227	Total		73
Hemoglobin, gm. per 100 c.c.	Cases	Treatment, other types		Cases
5–6	4	Pack alone†		54
6–7	10			
7–8	17	Manual	alone	8
8–9	27	removal	with pack†	23
9–10	25	Repair of lacerations		12
10–11	21			
11–12	13	Dilatation, curettage		2
12–13	6			
13–14	3	Rectal pack		1
14	3			
Total	129	Total		100

*Figures pertaining to treatment with ergonovine were taken only from the last five-year period of this study, since ergonovine was not available during all of the period 1932 to 1936.
†In cases in which intra-uterine packing was employed, the morbidity rate was 10.4 per cent, or 8 cases in 77. In the recent five-year series it was only 4.4 per cent, or 2 cases in 46.

had postpartum hemorrhage, on casual survey, there was no increase in the fetal death rate over the total series of 5,207 deliveries. There were five fetal deaths in the group of thirty-two miscellaneous cases of hemorrhage, a rate of 15.6 per cent. Three of these deaths were associated with rupture of the uterus and one was caused by prematurity (weight of fetus, 1,290 gm.) associated with circumvallate placenta. The fifth fetal death occurred neonatally in a premature infant (1,126 gm.), in an instance of suspected abruptio placentæ or miscarriage at thirty-one weeks' gestation. The fetal mortality rate as associated with placenta prævia and abruptio placentæ is discussed herein under the respective headings of the two conditions.

TABLE V. MISCELLANEOUS TYPES OF HEMORRHAGE IN THE LAST TRIMESTER OF PREGNANCY

Bleeding	Cases
Without evidence of placenta prævia	14*
Significant antepartum bleeding without evidence of placenta prævia or abruptio placenta	9†
Due to ruptured uterus	3
Due to circumvallate placenta	3
Due to cervicitis	2
Due to low implantation of placenta	1
Total	32

*In 8 cases a presumptive diagnosis of partial abruptio placenta was made.
†In 2 cases placentagrams revealed normal implantation.

Placenta Prævia

There were fifty cases of placenta prævia, or an incidence of about one in 108 cases, which is somewhat higher than the usual incidence reported. The clinical diagnosis was confirmed by vaginal examination carried out in a sterile manner in all but three of the earlier cases; in these three cases confirmation was made by cesarean section only. Placenta prævia was central or complete in seventeen cases, partial or marginal in twenty-six cases and lateral (just palpable at the edge of the cervix) in seven cases. This classification is based on the results of vaginal examination regardless of the degree of cervical dilatation or effacement found on such examination. There were three sets of twins. In twenty-one cases the fetal weight was less than 2,500 gm. Bleeding was present in all cases, being moderate in eighteen cases, moderately severe in twenty-six and severe in six cases. Some degree of shock was presented by fourteen patients. Twenty-seven patients had estimations for hemoglobin of 10 gm. or less per 100 c.c. of blood, these determinations being taken at least twenty-four hours after delivery. Thirty-eight of forty-six patients did not complete the thirty-eighth week of gestation. Fetal death occurred in thirteen instances among a total of fifty-three babies delivered, resulting in a gross fetal mortality rate of 24.5 per cent. When this gross rate is corrected, to eliminate fetuses that were either dead or expiring on admission of the mothers and those less than 1,800 gm. in weight at birth, the figure decreases to five fetal deaths, or a rate of

).4 per cent. In Table II are shown the obstetric nethods used to control hemorrhage and effect lelivery. Cesarean section, carried out eighteen imes, usually was reserved for central or com-

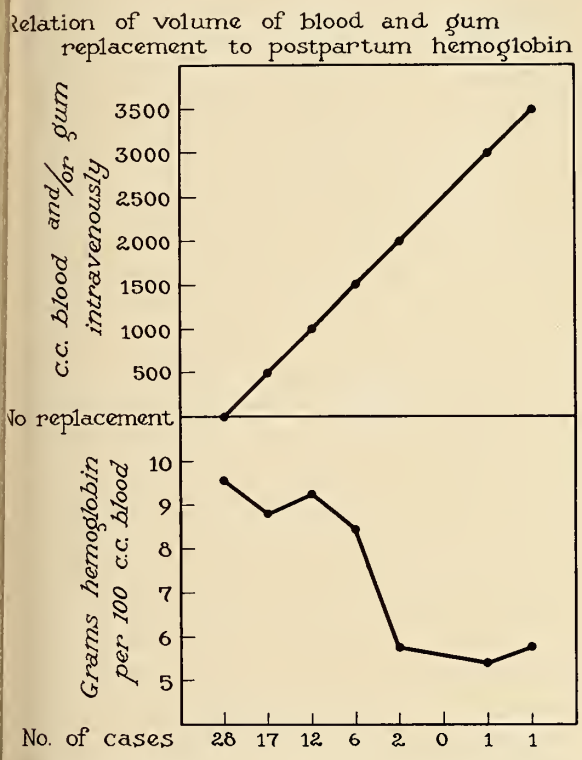


Fig. 2. In this figure it is seen that although patients who have severe hemorrhage receive much larger volumes of blood for replacement, an anemia results which is more severe than that ensuing among patients who have suffered less loss of blood and have been treated by replacement of blood.

plete placenta prævia. It will be noted that in the majority of the remaining cases relatively simple means were required to control bleeding and later to effect delivery. The fact is strikingly brought to attention that when delivery through the pelvis is decided upon, efforts to control bleeding and to effect delivery are not one and the same process, to be carried out simultaneously. It is obviously true that pregnancy is the cause of bleeding in placenta prævia, but it is likewise true that careful, nontraumatic use of such measures as rupture of the membranes or the bag will effectively control the hemorrhage and will do so much more safely than the disastrous assaults on the partially dilated cervix formerly done for placenta prævia.

Abruptio Placentæ

Abruptio placentæ, or premature separation of the normally implanted placenta, occurred thirty-five times during the ten years in question. This condition seems to be encountered with relative frequency among older multiparæ, since sixteen of the thirty-five patients were more than thirty-

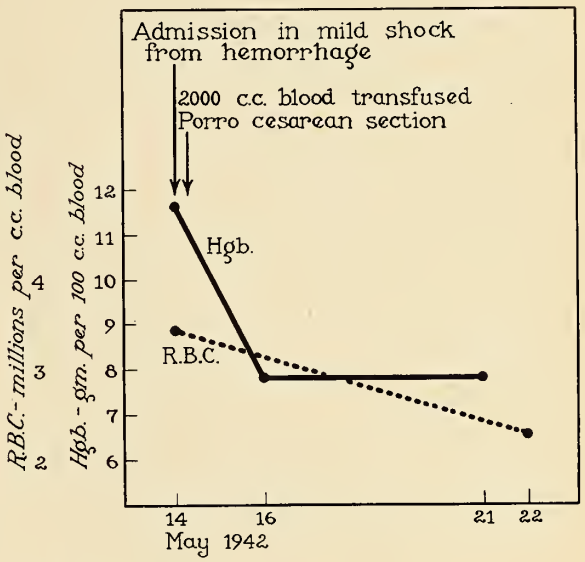


Fig. 3. Determinations of the hemoglobin and erythrocytes of the blood of a patient who had severe abruptio placentæ and hemoconcentration during hemorrhage; days later in the puerperium, after the blood volume adjusts itself, the true anemia of the patient becomes evident in spite of large volume of blood transfused and the not excessive loss of blood at cesarean section in the interim. This illustrates strikingly the fallacy of dependence on determinations of hemoglobin and the erythrocyte count of the blood as guides to loss of blood during the occasional occurrence of severe hemorrhage.

five years old; ten patients had had more than three children; five had had more than six children. A definite toxemia of pregnancy (chronic hypertensive type) occurred among slightly more than half (eighteen) of the patients. The hemorrhage was graded as 1 in sixteen cases, as 2 in ten, as 3 in six and as 3+ in three. In Table III are represented the data on treatment and the method of delivery in these thirty-five cases. The gross fetal mortality rate for the series (thirty-five cases) was seventeen fetal deaths or 48.6 per cent. When this rate is corrected according to criteria noted in the previous section (placenta prævia), the incidence of fetal death is five cases, or 14.3 per cent.

Postpartum Hemorrhage

In Table IV are represented the data on postpartum hemorrhage. It will be noted that in the majority of cases (117) hemorrhage was of grade 1 (estimated loss of blood from 500 to 600 c.c.). The incidence of febrile morbidity for the total of 227 cases, computed according to the

standards of the American Committee on Maternal Welfare, was 13.7 per cent, or thirty-one cases.* It is noteworthy that in the first five-year period of this study the rate of morbidity was 17.6 per cent and that in the latter five-year period the same rate was only 9.9 per cent.*

At the clinic the treatment of postpartum hemorrhage has been rather simple. Many time-honored methods of doubtful value which are still repeated in modern textbooks but which are of little practical use, have been omitted. In the presence of hemorrhage, with a partially separated placenta, if simple expression does not deliver the organ, Credé expression is attempted and if this fails, manual removal is not delayed while the patient bleeds dangerously. The uterus is usually packed if manual removal is carried out. Iodoform gauze for years has proved to be a highly satisfactory material for this purpose. If hemorrhage ensues just after the third stage of labor, the uterus is promptly and vigorously massaged to a state of firm contraction, and if necessary is maintained in this state by bimanual (vaginal-abdominal) pressure while ergonovine is administered intravenously. If atony and significant bleeding persist, the fundus, lower uterine segment and vagina are firmly packed with iodoform gauze. If the uterus bleeds through such a pack, a second one is inserted after removal of the first pack, and if hemorrhage still persists, hysterectomy is considered at once. Obviously, if postpartum hemorrhage is due to operative trauma, surgical repair will suffice to control it, and is the only treatment indicated if the uterus retains satisfactory tone.

Intrauterine Tamponade

Special mention might be made of the rather frequent use of the iodoform pack. Dr. Robert D. Mussey has employed this procedure, on proper indication, since the establishment of the Section on Obstetrics and Gynecology at the Mayo Clinic, and still finds it satisfactory. It is possible that impregnated iodoform, when in the uterus, may actually cause the uterus to secrete into the pack and thus remove bacteria from the uterus. At least, this type of gauze partially soaks up those intra-uterine contents which are in fluid form and when the gauze is removed it helps to rid the uterus of pathogens, if they have been present. Anderson and associates[1] found it fully as effective as the sulfanilamide pack. Only one instance of sensitivity to iodine has been observed in our experience, and this, although it was cause for some concern, was of no serious consequence to the patient. It will be noted in the footnote to Table IV that in seventy-seven cases in which the intra-uterine iodoform pack was used during the complete ten-year period there were eight cases of febrile morbidity, or a morbidity rate of 10.4 per cent, as contrasted with a morbidity rate of 13.7 per cent for the total of 227 cases of postpartum hemorrhage in the series. Likewise, as seen in the footnote to the same table, there were only two cases (4.4 per cent) of febrile morbidity in forty-six cases in which the intra-uterine pack had been used (in the last five-year period under study). Therefore, in the aforementioned five-year period, when the iodoform intra-uterine pack was used in forty-six cases, the morbidity rate (4.4 per cent) was only half that for the total number of cases in the entire five-year series (9.9 per cent).*

We agree with Pastore[2] that the obstetrician should use the so-called radical procedures of manual removal and/or intra-uterine packing as soon as they are indicated, rather than to wait until the patient is in a state of deep shock and nearly exsanguinated. When these procedures are carried out correctly, the morbidity rate is so decidedly reduced that there will be less concern, even though in a few cases packing may be carried out when it might not have been absolutely indicated for the survival of the patients. We feel that proper intra-uterine tamponade not only has saved some patients from death by postpartum hemorrhage but that it has also spared many women the needless loss of large volumes of blood. According to Pastore and our own records, it is the loss of large volumes of blood plus late radical intervention which make for increased morbidity. Vigorous emphasis need hardly be given to the necessity for aseptic technique in invasion of the birth canal, and especially in invasion of the uterus itself. Asepsis should be at least as rigid as that employed when the peritoneal cavity is opened.

Hysterectomy

The rôle of hysterectomy as a procedure for

*The morbidity rates seen as footnotes to Table IV apply only to seventy-seven cases in which packing of the uterus was carried out, and not to the entire series of 344 cases of true obstetric hemorrhage or to the 227 cases of postpartum hemorrhage.

*The forty-six cases in which the intra-uterine pack was used of course are included in the total number of cases in this second five-year period on which the morbidity rate of 9.9 per cent was computed.

the control of obstetric hemorrhage has, to some extent, been neglected in the literature. Seldom is obstetric hemorrhage so severe or intractable as to require removal of the uterus, and yet, perhaps because of this very fact, women afflicted by this type of obstetric hemorrhage often are the ones who die of hemorrhage if hysterectomy is delayed unduly or is not considered at all. Fortunately, most women who require hysterectomy because of tremendous and otherwise uncontrollable obstetric hemorrhage are multiparæ, and hence already have the benefits of living children; but if it appears the patient will die of hemorrhage if removal of the uterus is not performed, it is the physician's duty to disregard parity and to provide her with the one chance of survival which hysterectomy (plus, of course, continuous supportive treatment with transfused blood and other measures) will afford. Hysterectomy was performed without a maternal death in four of the 344 cases of obstetric hemorrhage in the decade reviewed. The indications were: complete rupture of the uterus, two cases; abruptio placentæ, one case; and postpartum hemorrhage caused by uterine fibroids, one case. In the current year of 1942 (which is not included in this survey) it has twice been necessary to resort to hysterectomy, once in the presence of abruptio placentæ and once because of intractable postpartum hemorrhage (but not intra-uterine rupture) in the presence of placenta prævia. The average volume of blood and blood substitutes (excluding fluids such as solutions of sodium chloride and glucose) required to support these patients safely after hemorrhage and hysterectomy was about 2,500 c.c. In one instance the volume required was 4,400 c.c., and in the puerperium the value for hemoglobin was 5 gm. per 100 c.c., in contrast to a value of 14.0 gm. per 100 c.c. before the hemorrhage began. It could thus be estimated that this particular patient lost as much as or more than her total blood volume, but nevertheless survived.

The Rh Factor

Since new knowledge has been gained of the role of the Rh factor in the production of serious reactions to transfused blood, I reviewed the records of the 344 cases of hemorrhage discussed herein from this standpoint. There was only one serious reaction, but the patient was not available, although she is still living, for testing for this factor in her blood. One patient, in her first pregnancy gave birth to a normal infant that survived, but two infants subsequently born to her died of proved erythroblastosis. Blood was transfused without event to this patient during her first pregnancy for severe anemia. The recipient has been recently tested as Rh-negative, and it is planned to test the blood of the donor for the Rh factor, since she lives relatively close to the clinic.

Comment

Assuming that by means of prenatal care constant vigilance is exerted to detect antepartum hemorrhage at an early stage, there remain only two principles the practice of which will satisfactorily reduce the mortality rate of hemorrhage to a bare minimum. These are: the early application of proper and effective obstetric hemostasis and the replacement of blood volume by transfused blood or an acceptable blood substitute to prevent death from exsanguination or shock. The first of these two principles is considered to be the more important.

The methods available for control of various types of hemorrhage have been presented herein, and do not need further repetition except for the reassertion that the safest method for control of hemorrhage often is not one directed toward immediate and perhaps traumatic delivery. The situation is analogous to that in the management of most instances of toxemia of pregnancy, in that, although pregnancy is the cause of the complication, conservative procedures to effect delivery often will produce results conducive to a decidedly lower mortality rate, even though they may require more time and effort on the part of the physician than other procedures would.

The physician can rarely escape the responsibility of dealing promptly and intelligently with obstetric hemorrhage, since almost all impartial surveys of maternal deaths show that the patients nearly always present themselves to the physician at an early time.

Nonobstetric Treatment of Hemorrhage and Shock in Pregnancy

In this section are presented some points in the treatment of the hemorrhage which relate to the restoration of blood volume lost by hemorrhage:

Blood or Blood Substitutes.—These, like any other agents in treatment, should be used in sufficient quantity to obtain the desired therapeutic effect. In this case the desired effect is

to keep the patient out of a state of shock and to relieve serious anemia. Insufficient treatment will result in death of the patient by exsanguination or will leave her barely surviving, with a value for hemoglobin which is dangerously low.

In Figure 2 it is seen that in spite of the fact that this principle was constantly borne in mind, patients who received larger volumes of blood were those among whom anemia was greatest in the puerperium, and the anemia often approached dangerous limits.

Vasoconstricting Agents.—Vasoconstrictors such as 3 minims of epinephrine injected through the intravenous hose are very helpful in initiating the treatment of profound shock, provided the right part of the heart is at once supplied with enough circulating fluid.

Determinations of Hemoglobin and Erythrocytes Valueless.—In some phases of hemorrhage hemoconcentration occurs, so that determinations of hemoglobin and erythrocytes are worthless as measures of the severity of hemorrhage (Fig. 3). The blood pressure is the best indication of shock arising from hemorrhage and of the patient's response to treatment.

Solutions.—Solutions, such as those of sodium chloride and glucose, are not to be depended on for effective treatment of shock and hemorrhage, although they may be lifesaving in maintaining the patient until blood or a good substitute for it can be had. In the presence of excessive hemorrhage and shock any innocuous fluid in the vein is better than none.

Blood Pressure in Shock.—It is a good rule never to allow a patient's blood pressure to remain at so-called shock levels for longer than twenty minutes. Each minute a patient remains in a state of such deep shock that blood pressure cannot be elicited the chance of that patient's recovery diminishes, even though she may be retrieved temporarily from shock.

Presence of Toxemia and Diabetes.—Patients who have toxemia should not be treated with solutions of sodium chloride and patients known to have or suspected of having diabetes should not receive solutions of glucose during an emergency.

Blood Substitutes and Acacia.—Satisfactory blood substitutes are now available in the form of plasma and solutions of acacia and can be used even in rural practice. At the clinic our experience with solutions of acacia has been entirely satisfactory in more than 100 obstetric cases and in general in more than 6,000 administrations of it.

Need for Positive Pressure in Giving of Solutions in Shock.—Patients in deep shock may be found by the usual tests to be without pulse and blood pressure and they may have collapsed veins. It is easy to reach and puncture the veins satisfactorily but solutions will not flow by gravity, positive pressure being necessary. Failure to realize this will waste valuable time while the attendant searches for another vein or cuts down on one. In only one of the cases referred to herein was it necessary to cut down on a vein, although positive pressure was required on several occasions. Failure to recognize this situation has cost the lives of many patients by hemorrhage.

Risk of Transfusion of Blood.—Because the transfusion of blood is associated with a small but definite risk, even in experienced hands, it is a procedure not to be used promiscuously. It is obviously better, when feasible, to avoid the necessity for the transfusion of blood by the prompt institution of effective procedures to control the hemorrhage early and as completely as possible.

Conclusions

Evidence is presented which indicates that the reduction in the number of maternal deaths from hemorrhage has not kept pace with the reduction of maternal mortality from the other two main causes of death; namely, sepsis and toxemia. It therefore appears that there should be an improvement in the use of available obstetric methods for the control of hemorrhage, and especially should facilities for the transfusion of blood and good blood substitutes be made available to the entire population of the state.

Ten years' experience with the hemorrhages of late pregnancy and the puerperium is reviewed. There were two maternal deaths in the earlier half of the series (0.4 deaths per 1,000 deliveries), both of which were caused by sepsis several days after delivery. There were no deaths from hemorrhage directly.

References

1. Anderson, H. E., Gardner, H. L., Gunderson, M. F., and Slack, J. M.: The use of uterine packs impregnated with sulfanilamide: a preliminary report. Am. Jour. Obst. and Gynec., 43:410-422, (Mar.) 1942.
2. Pastore, J. B.: A study of the blood loss in the third stage of labor and the factors involved. Am. Jour. Obst. and Gynec., 31:78-92, (Jan.) 1936.

POSTPARTUM HEMORRHAGES AND ASSOCIATED PROBLEMS

HORACE D. McGEE, M.D.

Saint Paul, Minnesota

MOST obstetricians and general practitioners practicing the art of midwifery have been confronted with one or more serious postpartum hemorrhages. Indeed, the anxiety caused by appalling, uncontrollable bleeding has left a vivid, horrible memory to many of them. It requires but a short time on an obstetrical ward to become impressed with the relative frequency of excessive and dangerous blood losses. It is further obvious that estimations of blood loss by many physicians and personnel of institutions are often inaccurate and prejudiced. There is the "too frequent maximum estimation of 500 c.c." when it is obvious to even a casual observer that a more accurate figure would be 1,500 to 2,000 c.c. We believe, therefore, that it is important to report blood loss data from time to time if for no other reason than to encourage the members of the medical profession to become "blood loss" conscious. Suitable measures should then be taken to combat certain evils responsible for the postpartum hemorrhages.

Competent investigators have almost unanimously been impressed with the frequency of the above complication. They all agree that most physicians underestimate blood loss especially when in the hemorrhage levels. Thus, Litzenberg[5] using 600 c.c. as the borderline, finds the incidence as 7.1 per cent. Williams[17] reports a 13 per cent incidence; Peckham,[12] 6.14 per cent; Plass,[5] 9 per cent; Pastore,[10] 6.4 per cent; and Reich,[14] 5.65 per cent. This present report is no exception! We, too, were impressed—and alarmed.

Our series comprises 1,007 consecutive cases, most of which were delivered by interns under the supervision of the resident. It is obvious that certain evils arise when one considers the differences in intellect, ability, and judgment of a large group of interns. Thus, faulty technique in the management of the third stage undoubtedly accounted for some of our hemorrhages. It was noticed that a preponderance of our hemorrhages occurred during the first few days of the change of hospital service. Pastore,[10] likewise, has reported this observation and confirms the statement that experience and ability of the operator and his assistants have a marked effect on blood loss.

It must be admitted that no method of measuring blood loss in the third stage is 100 per cent accurate except by extremely technical chemical procedures. However, an honest attempt at measurement is considerably more accurate than by mere estimation alone. Our method is simple, reasonably accurate, and sterile in that no pans or instruments cause contamination by pressing on the patient's perineum. In our drapes a sterile oiled nonabsorbent paper is folded in the shape of a funnel with the base under the patient's buttocks and the apex toward the floor where the blood is caught in a basin. There is no soaking of drapes and the blood thus caught may be added to the blood expressed with the placenta. In our hands this method has been very satisfactory.

A study of blood loss naturally leads to other associated problems such as the effect of drugs, observations of the placental stage, involution, morbidity, mortality, et cetera. Our series of 1,007 cases were separated into two alternate groups as follows: Group 1 received 1 c.c. of obstetrical pituitrin post second stage, 1 c.c. of hypodermic ergot preparation post placental stage, and ergotrate tablets gr. 1/160 every three hours for twenty-four hours and every four hours for the following forty-eight hours. Group 2 received only 1 c.c. of the hypodermic ergot preparation after the placental stage. An attempt was made to measure accurately the time of placental separation in minutes and seconds by the usual signs such as cord advance, gush of blood, and elevation of the uterus into a globular firm mass. The placenta was then expressed as soon after the separation as possible at the time of a uterine contraction. Failures to observe the process of placental separation and to express the placenta in spite of a relaxed uterus accounted for several of our severe hemorrhages and retained placentas. Retained placentas and hemorrhages were almost uniformly more prevalent during the first week of each service change since supervision was impossible in all cases.

From the Obstetrical Department, Ancker Hospital, Saint Paul, Minnesota.

TABLE I. HEMORRHAGES IN CUBIC CENTIMETER GROUPS

Blood Loss (in c.c.)	Group 1 No. of Cases	Group 2 No. of Cases
600– 700	10	10
700– 800	7	12
800– 900	4	12
900–1000	2	7
1000–1100	6	5
1100–1200	2	2
1200–1300	1	2
1300–1400	1	2
1400–1500	0	4
1500–1600	2	3
1600–1700	2	0
1700–1800	0	2
1800–1900	2	1
1900–2000	0	0
2000–2100	0	0
2100–2200	1	0
2200–2300	1	1
2300–2400	0	0
2400–2500	2	1
2500–2600	1	0
3400–3500	0	1
Total	44	65

Calkins[2] stresses the importance of uterine massage after the placental separation before expressing it. He reports the low average blood loss of 179 c.c. in 800 cases.

Blood Loss

Our results on blood loss were as follows: Group 1 showed an average of 232 c.c. compared to 276 c.c. in group 2 or an average of 254 c.c. for the entire series. In group 1 there were forty-four hemorrhages of 600 c.c. or over for an incidence of 8.6 per cent while in group 2 there were sixty-five hemorrhages for an incidence of 13 per cent. The average incidence in the two groups was 10.8 per cent. This figure is somewhat higher than that reported by other observers, but is below William's[17] figure of 13 per cent. Table I groups the hemorrhages into 100 c.c. columns.

TABLE II. CAUSES OF THE HEMORRHAGES

	Group 1	Group 2
Atonia alone	20	32
Atonia, episiotomy and lacerations	3	2
Atonia and cervical lacerations	2	2
Atonia following abruptio placenta	5	2
Retained placentas	4	15
Adherent placentas with manual removal	3	2
Retained placentas due to pituitrin	4	0
Low implantation of the placenta	0	1
Placenta Praevia	0	2
Retained membranes	0	2
Laceration of the cervix	0	2
Episiotomy	0	1
Caesarian section	1	0
Cause unknown	2	2
Total	44	65

As would be expected most of the above hemorrhages were in the 600-700 c.c. group. It is interesting, however, to notice the astoundingly high blood loss of 3,400 c.c. in group 2 and the frequency of hemorrhages in the 2,000-2,600 c.c. group. In spite of such appalling hemorrhages there were no maternal deaths from this cause and it is interesting to note that the patient often exhibited little or no evidence of shock despite the losses reported. However, because of the possibility of secondary manifestations of shock, intravenous fluids were started early and blood cross-matched immediately. An effort was then made to replace the lost blood as soon as possible. In no case was uterine packing performed thus suggesting that this dangerous procedure is seldom required.

In ascertaining the causes of hemorrhage it must be acknowledged that certain overlappings occur. Thus, Table II attempts to classify the causes of hemorrhage into various groups.

From the above chart it is apparent that atonia was the preponderant cause of hemorrhage in both groups. In fact, this one factor accounted

for nearly half of the cases. It is evident that much of this group can be eliminated by proper management of the third stage. This may be accomplished by intensive teaching of our medical students and interns. It must be emphasized that expression of the placenta without uterine contraction is extremely dangerous and undoubtedly the cause of many unnecessary postpartum hemorrhages.

Pituitrin after the second stage has often been accused of causing retained placentas by contraction of the lower uterine segment before the placenta is expelled. In our series there were four cases attributable to this medication of which none was serious. On the other hand there were fifteen retained placentas in group 2 which received no pituitrin. If the four retained placentas due to pituitrin are added to the four other cases in group 1 there is still a preponderance of retained placentas (fifteen to eight) in the group receiving no pituitrin. This would seem to indicate that pituitrin has a beneficial effect after the second stage in a certain number of cases in which separation and expulsion of the placenta is delayed.

Our series indicate that long labors due to abnormal presentations, contracted pelvis, et cetera, markedly increases the blood loss. Thus, in posterior presentations the average blood loss was 415.6 c.c. compared to 254 c.c. in the entire series. The first stage averaged 11.77 hours in the entire series compared to 17.6 hours in posteriors while the second stage was 43.5 minutes compared to 1 hour 31 minutes in posteriors. This observation is contrary to that expressed by Calkins[3] who considers posterior presentations normal. He finds very little difference in the length of labor in anterior and posterior presentations. He[4] further states that the length of labor has no influence on the amount of blood loss in the third stage. Our experience, however, has taught us to respect long labors if for no other reason than the danger of hemorrhage—and this in spite of rests, fluids, and adequate nursing care. Calkins does emphasize a point, however, to which we fully subscribe, namely the marked influence of ether and other gas anesthetics on the blood loss. We, like he, advise the discontinuance of anesthesia after the second stage as soon as possible in order to allow the uterus to contract firmly. If anesthesia is required later for the repair or other procedures it may be readministered.

In summarizing this part of this report we wish to emphasize once more the remarkable tolerance of pregnant women towards blood loss. Their apparent plethoric state has been verified time and again. This single factor has allowed many physicians to "get by" when they estimated the blood loss at 500 c.c. It is important to remember that shock rarely or ever occurs from a blood loss of 500 c.c. unless accompanied with other complications. Thus, when an obstetrical patient is in shock in spite of average blood loss, one must think of other complications such as ruptured or inverted uterus, embolism, heart failure, et cetera.

Placental Separation

Various reports on the timing of placental separation are found in the literature. The older works almost uniformly reported longer placental stages than the more recent investigations indicate. Thus, until the past few years students were taught that this stage lasted fifteen to twenty minutes. Recent observations show that the placental separation is often simultaneous with the second stage or in the first minute thereafter. Davis and Boynton[7] found that when intravenous ergot was injected at the time the anterior shoulder was brought into view, the placenta was delivered in less than three minutes in 754 out of 1,020 cases. However, when the ergot was not given until after the placenta was delivered the placental stage was usually over four minutes. In our series the average time of placental separation was 4.17 minutes, being 3.5 minutes in group 1 and 4.84 minutes in group 2. It must be realized that this difference in the two groups is probably not due to pituitrin since the action of pituitrin intramuscularly is not obtained until 3 to 5 minutes according to Davis.[6] It can further be stated that a great number of the placentas in both groups separated immediately or in the first minute but that a few retained placentas made the average much higher than usually obtained.

In spite of the usual text book signs of placental separation, it is not always easy to determine this phenomenon. We are certain that in some cases hemorrhage was caused by too hasty expression with resulting partial separation and atonia of the uterine musculature. However, many hemorrhages were also caused by "too late" expression with a resultant filling of the uterus

with blood back of the placenta. The old teaching of waiting for the mother to expel the placenta is not justified. There is danger of contamination and excessive fatigue in a patient who is already exhausted in most cases. The patient is anxious to rest and a simple expression will allow her to return to bed. In most cases the placenta was easily expressed. In others, supposedly retained placentas were expressed with little difficulty by the resident though the intern encountered difficulty due to inexperience. Some of the retained placentas occurred in obese women the obvious difficulty simply being failure to palpate the uterus. We encountered no inversions of the uterus or other unfavorable complications by our expression technique. Occasionally the cervix was pushed downward too far so that it presented at the introitus. By simply inserting the hand downward above the symphysis the uterus could usually be brought to a higher position. It was noticed that unless the uterus was thus replaced bleeding was often quite profuse.

Morbidity

A study of blood loss necessarily involves a determination of morbidity. Our definition of morbidity is commonly cited and so any patient with a temperature of 100.4 on any two days of the puerperium after the first twenty-four hours is considered to have a morbidity. In spite of our high incidence of hemorrhages our morbidity was only 4.75 per cent and was approximately the same in both groups. This figure compares very favorably with the reports in the literature and includes any condition causing fever in the puerperium. No attempt was made to exclude upper respiratory infections, pneumonia, pyelitis, or other incidental infections. Peckham and Kuder[13] report a clinic morbidity of 17.10 per cent with 39.62 per cent for operative procedures and 24.46 per cent for spontaneous deliveries with hemorrhage. Our low morbidity is undoubtedly due to several factors. The most important one is that very conservative obstetrics is practiced, forceps of any kind being applied only when indicated and after consultation with the attending man. Vaginal examinations are prohibited unless necessary, all visitors (including the husband) are barred, and all unnecessary procedures are discouraged. We attempt to replace blood in those who have obviously suffered from hemorrhage or whose hemoglobins are unnecessarily low. Lately the sulfonamide group of drugs has helped our records. It is interesting to notice that the morbidity in the two groups was similar, indicating that perhaps the routine use of ergot preparations in the postpartum period is of doubtful value from this point of view.

Involution

This study was undertaken primarily to evaluate the effect of ergot in the postpartum period. Thus, group 1 was given ergotrate gr. 1/160 every three hours for twenty-four hours and then gr. 1/160 every four hours for the next forty-eight hours. Group 2 received no ergot preparation whatsoever. On the day of discharge the height of the fundus above the symphysis was accurately measured in centimeters. Interestingly enough, no beneficial effect was noticed in group 1. Thus, in group 1 the height of the fundus was 6.18 cms. on the eighth postpartum day and 5.61 cms. on the ninth day while in group 2 it was 6.29 cms. and 5.79 cms. It should not be difficult to understand why there is little or no difference. In fact one might argue that perhaps ergot slows involution by causing excessive contraction of the uterine musculature with an obvious local anemia due to constriction of the blood vessels. Galloway[8] considers involution as the most important physiologic change taking place in the puerperium and agrees with Teacher and Wormser[15] that the most important factor in involution is proper separation of the placenta with complete removal of all the products of conception. Adair, Davis, Kharasch, and Legault,[1] working with ergotocin, concluded that in all instances the process of involution was hastened or favored by the use of this preparation. They also stated that in infected cases ergotocin seemed to hasten expulsion of the lochia, increased contractions, and helped involution. We, however, have failed to substantiate this finding, our infected cases showing just as rapid involution as the clean ones provided all the products of conception were removed. Kronig, in 1901, held that infection does not interfere or delay the regeneration of the mucosa. Williams'[18] observations indicated that neither the existence of moderate infection nor retention of fetal tissue following abortion or full term labor seriously interfered with regeneration outside the placental site although def-

initely delaying the involution of the latter. He showed that the placental site usually disappeared about the seventh postpartum week while outside the placental site the mucosa was completely restored by the fourth week.

Postpartum examinations at six weeks failed to reveal a difference in involution of the two groups. Thus, the number of subinvolutions, retroversions, erosions, etc., were approximately the same in each group. One interesting observation was that the duration of the red lochia is considerably longer in both groups than previously taught. In many of our patients the red lochia persisted for three to four weeks even though involution seemed to be normal at the six weeks' examination. Often the red lochia returns after the patient resumes her duties at home and may persist three to six weeks in extreme cases. Moir,[9] studying 250 patients, found the average duration of red lochia to be twenty-four days in contrast to previous teaching of four to ten days. In his series subinvolution and retroversion did not prolong the red lochia stage. Nursing, age, and parity likewise had no effect.

In group 1 complaints of after-pains were much more frequent than in group 2. In a few cases the pains after the administration of ergotrate were so severe that the patient requested its discontinuance. Primiparous women seldom complained of after-pains in either group, an observation often confirmed.

Drug Reactions

Before the routine use of any drug is prescribed a thorough study must be made as to its toxity, untoward reactions, and danger to life. It is important and imperative that all untoward reactions be reported to the medical profession. Though we had no deaths from the administration of drugs, the anxiety and worry caused by certain reactions warranted extreme caution before the use of routine pituitrin or ergot, especially by the intravenous route. In two cases our hypodermic preparation of ergot caused extreme shock, skin manifestations, dyspnea, and other side reactions. In three cases ergotrate tablets had to be discontinued because of severe pains in the legs. That the fluid extract of ergot is dangerous is indicated in the unpleasant reactions of nausea and vomiting and the state of ergotism and dry gangrene of the extremities with prolonged administration. Thus, Welkoff and Ferguson[16] reported bilateral dry gangrene of the legs after the patient had taken two fluidounces over a five-day period. Davis and Boynton,[7] studying ergonovine, state that this drug has no undesirable reactions regardless of the mode of administration. This statement seems dangerous, however, since some individuals may be allergic to any vegetable product. It is true that they may not have encountered any reactions in their relatively small series but such a statement seems unlikely to hold in a larger group. Just one death from a routine drug would justify its discontinuance unless the effects through reduction in blood loss and hemorrhages markedly offset this danger.

Pastore,[11] working with intravenous pituitrin (1.5 minims of surgical pituitrin in 2.5 c.c. normal saline), had 5 cases of pituitrin reaction out of ninety-six cases with one death. In patients with hypertension pituitrin causes marked elevation of blood pressure and also causes urinary retention according to Davis.[6]

Would it not be safer to reserve intravenous ergot and pituitrin to those relatively few cases of atonia which can't be controlled otherwise? Our unfortunate reactions have encouraged us to assume a skeptical attitude.

Mortality

There was one death in this series—a five and one-half month probably self-induced abortion of a hydrops fetalis fetus, retention of the placenta, manual removal of a necrotic, edematous enlarged placenta, severe transfusion reaction, and death on the third postpartum day from gas bacillus infection (B. Welchii). This patient had severe abdominal pain, rapid pulse, and a temperature of 102.4° before delivery indicating that perhaps the patient had the infection prior to delivery. It was difficult to determine whether the symptoms after delivery were due to the gas bacillus infection or to the transfusion reaction since both are similar.

Fetal Mortality

The fetal mortality in this series was only thirty-eight in 1,007 coses. Thus, there were ten macerated fetuses, seven stillborn intrapartum deaths, fourteen premature neonatal deaths, and five neonatal term births. Of these, fifteen were under 3 pounds, the smallest weighing only 380 grams. Any fetus 27 centimeters or more was

used in the statistics and was reported to the state board of health.

That conservative obstetrics was practiced is evident since only three cesarean sections were performed and that 945 out of 1,007 cases were allowed to deliver spontaneously. This fact alone is meaningless unless the fetal and maternal mortality and morbidity are correspondingly low. Since in this series both the maternal and fetal mortality *were* low we wish to emphasize the well-known observation that conservatism in obstetrics pays the highest dividends in the final analysis.

Conclusions

1. Estimations of maternal blood loss are inaccurate. There is a tendency to underestimate excessive losses and to overestimate minimal amounts.

2. Pregnant women seldom show clinical signs of shock unless blood loss is excessive (usually over 1,000 c.c.) unless other factors such as trauma, anemia, malnourishment, etc., are also present.

3. In our series hemorrhages over 600 c.c. were encountered in 10.8 per cent of our cases.

4. Hemorrhages occurred 4.4 per cent less in cases in which pituitrin was used after the second stage than in those in which none was used.

5. Our average blood loss was 254 c.c., being 44 c.c. less in the group receiving pituitrin.

6. Long labors from any cause tend to increase the loss of blood.

7. Blood loss should be replaced as soon as possible to reduce morbidity, secondary shock, and to prevent anemia and subsequent complications.

8. Uterine atony accounted for approximately half of all our hemorrhages.

9. Most placentas separate in less than one minute. The average time in our series was 4.17 minutes but this average is erroneous since a few retained placentas markedly increased the average.

10. Pituitrin by hypodermic injection had little or no effect on placental separation since most of the placentas were separated before the pituitrin had time to exert its effect.

11. Timely expression of the placenta is beneficial to the patient both in the reduction of blood loss and in allowing the patient to return to bed for needed rest.

12. The routine use of ergot has its doubtful value since in this series it failed to lower morbidity, failed to encourage involution, was responsible for severe after-pains, and in a few cases produced serious reactions.

13. Pituitrin must be used with extreme care since severe reactions are not uncommon.

14. The maternal mortality was 1 death in 1,007 cases, a 5½ month probably induced abortion, the patient dying from gas bacillus peritonitis and transfusion reaction.

15. The fetal mortality was 38 cases in 1,007. Fifteen of these were under 3 pounds, ten of them being macerated.

16. The maternal morbidity was only 4.75 per cent, conservatism being responsible mainly in obtaining this low figure.

17. By reporting blood loss series it is hoped that the medical profession will become more "blood loss" conscious.

References

1. Adair, F. L., Davis, M. E., Kharasch, M. S., and Legault, R. R.: A study of a new and potent ergot derivative, ergotocin. Am. Jour. Obst. and Gynec., 30:466, 1935.
2. Calkins, L. A.: Management of the third stage of labor. Jour. Am. Med. Assn., 101:1128, 1933.
3. Calkins, L. A.: Occiput posterior—a normal presentation. Am. Jour. Obst. and Gynec., 43:277, 1942.
4. Calkins, L. A.: The third stage of labor. Am. Jour. Obst. and Gynec., 29:231, 1935.
5. Calkins, L. A., Litzenberg, J. C., and Plass, E. D.: Management of the third stage of labor with special reference to blood loss. Am. Jour. Obst. and Gynec., 21: 175, 1931.
6. Davis, M. E.: The use and abuse of ergot and pituitary. Jour. Am. Med. Assn., 1092:1631, 1937.
7. Davis, M. E., and Boynton, M. W.: The use of ergonovine in the placental stage of labor. Am. Jour. Obst. and Gynec., 43:775, 1942.
8. Galloway, E. C.: Postpartum care. Am. Jour. Obst. and Gynec., 21:558, 1931.
9. Moir, C.: Duration of red lochia. Lancet, 1:564, 1932.
10. Pastore, J. B.: A study of the blood loss in the third stage of labor and the factors involved. Am. Jour. Obst. and Gynec., 31:78, 1936.
11. Pastore, J. B.: The use of pituitrin intravenously in the third stage. Am. Jour. Obst. and Gynec., 32:280, 1936.
12. Peckham, C. H., and Kuder, K.: Some statistics of postpartum hemorrhage. Am. Jour. Obst. and Gynec., 26:361, 1933.
13. Peckham, C. H., and Kuder, K.: Some statistics of postpartum hemorrhage. Am. Jour. Obst. and Gynec., 26:361, 1933.
14. Reich, A. M.: A critical analysis of blood loss following delivery. Am. Jour. Obst. and Gynec., 37:224, 1939.
15. Teacher, J. H.: On the involution of the uterus, postpartum. Jour. Obst. and Gynec. Brit. Emp., 34:1, 1927.
16. Velkoff, A. S., and Ferguson, A. D.: Bilateral dry gangrene of both lower extremities due to ergot. Am. Jour. and Gynec., 44:331, 1942.
17. Williams, J. W.: The tolerance of freshly delivered women to excessive loss of blood. Am. Jour. Obst. and Dis. Women and Chil., 80:1, 1919.
18. Williams, J. W.: Regeneration of uterine mucosa after delivery with special reference to placental site. Am. Jour. Obst. and Gynec., 22:664, 1931.

DELAYED SPEECH FROM THE STANDPOINT OF A PSYCHOLOGIST

GRACE ARTHUR, Ph.D.
Saint Paul, Minnesota

IT IS not surprising that parents, teachers and even physicians become alarmed when a child fails to develop satisfactory speech habits at about the normal age. In a large percentage of several hundred cases of delayed speech observed, the slowness in learning to talk was symptomatic of slowness in general intellectual development. Sometimes the total picture was one of slower development than that of the average child, physically and emotionally as well as intellectually.

The histories of these cases showed unexpected variety. They included: birth injuries; brain tumor; encephalitis lethargica; poliomyelitis; epilepsies; poor general constitution, with lack of speech drive only one of many lacks; mutism, with speech drive reduced almost to the vanishing point; family histories of speech disorders of various kinds; hereditary feeblemindedness; glandular imbalance; defective hearing; mongoloid characteristics; structural anomolies that made the taking on of speech habits more difficult than for the average child; and various other conditions too numerous to tabulate.

The subsequent histories of these cases were as varied as those preceding examination. A very few made normal recoveries without special help. The majority continued to show retarded mental development, but in time developed some speech. Only a few failed to learn to say a few simple words. Of these few, only one was under immediate supervision from infancy to adolescence. This case had been diagnosed as an encephalitis shortly after birth.

Because of their good nature, children with mongoloid characteristics appear to be more trainable than certain other types. Glandular imbalance, slow general development accompanying prolonged illness during the first few years of life, defective hearing, and oral inactivity in children otherwise normal seem to be the conditions accompanying the delayed speech cases that respond best to therapy.

One child who earned a borderline rating (I.Q.78) on a Binet scale at the age of six, was helped to make a normal adjustment as speech cleared and at the age of ten was doing better than average school work with a Binet I.Q. of 106. Another child with about the same rating (I.Q.80) seemed more promising. The mother's attention, however, was absorbed by twin babies, and by the time she became alarmed enough to try to coöperate in plans for therapy, habits of non-understandable speech were so firmly fixed that little could be accomplished. Intelligence ratings on the Binet scales drop rapidly when the child cannot talk understandably, and so this child, by the time she reached adolescence, had earned a succession of feebleminded ratings that resulted in her placement in a school for the subnormal.

A duller child than either of these received intensive training over a long period. She not only learned to talk understandably, but made a comfortable school and social adjustment with a group several years younger than herself.

Because of the influence of speech upon Binet ratings, it is difficult to make a correct diagnosis for a non-talking child without the use of a nonverbal scale. Two children in the group had narrowly escaped commitment as feeble-minded on the basis of low ratings given them by examiners inexperienced in dealing with cases of delayed speech. One of these, with a Binet I.Q. of 110 is now in a junior high school. The other is in high school. He has a Binet I.Q. of 119, and an I.Q. of 141 on the Point Scale of Performance Tests. This is significant, as many cases of oral inactivity are non-verbalists in contrast with stammerers, who often tend to be highly verbalistic.

Another child with extreme oral inactivity earned a low average rating (I.Q.88) on the Kuhlmann-Binet Scale at the age of four. The mother was interested and intelligent enough to carry out detailed instructions. By the time this child was ready to enter the second grade, the rating had increased to "very superior" (I.Q. 136). Stammering is not unusual at one stage of recovery from severe oral inactivity, but may be temporary if recognized for what it is and given appropriate treatment. This child stammered for several months. The mother was con-

scientious in carrying out instructions. Since the stammering cleared, speech has been normal and school progress much better than that of the average child.

Whatever help is to be given the non-talking child should be given during the early years of rapid development. Therapy planned for the child with a poor speech drive is quite different from that given the child with a strong speech drive who is having difficulty in making himself understood.

Whatever the causative factors, the adjustment of the child with delayed speech needs to be watched. Help should be given until a satisfactory social and academic adjustment has been made. The nature of the adjustment depends upon many factors. For some children, the only comfortable adjustment will be in a school for the subnormal. For others, it will be college with honors. The important thing is for each child to get the help that he needs in time to enable him to develop whatever potential abilities he may possess.

Summary

In a large percentage of several hundred cases of delayed speech, slowness in learning to talk was symptomatic of slowness in general intellectual development.

The histories of these cases are varied. They include birth injuries, glandular imbalance, structural anomalies, defective hearing, oral inactivity and other conditions too numerous to tabulate.

In some cases normal speech developed. Only a few failed to learn at least a few simple words. The majority developed simple but understandable speech.

Because of their good nature and willingness to coöperate, children with mongoloid characteristics are often more trainable than other types.

Glandular imbalance, slow early general development resulting from prolonged illness, defective hearing, and oral inactivity in children otherwise normal appear to be among the conditions that respond best to therapy.

Because of the influence of speech upon Binet ratings, there is danger in using these scales as a basis for diagnosis in cases of delayed speech.

Whatever help is to be given the non-talking child should be given during the early years of rapid development.

It is important for each child to get the help he needs in time to enable him to develop whatever potentialities he may possess.

VITAMIN A IN THE TREATMENT OF HYPERTENSION

JACOB S. BLUMENTHAL, M.D. and MACNIDER WETHERBY, M.D.
Minneapolis, Minnesota

AT times hypovitaminosis of several of the vitamins has been reported as a possible factor in the causation of hypertension. There has been very little substantiating evidence but vast quantities of vitamins have been sold on this basis. Juan Govea Peña and M. Villaverde[2, 3, 4] of Cuba have recently reported on the use of vitamin A in large doses in hypertension. They rationalize this treatment by citing the work of Herfort[1] who states that vitamin A exercises a stimulating effect upon the internal and external secretions of the pancreas. They then state that assuming that these secretions contain hypotensive hormones, vitamin A would then exercise the same hypotensive action indirectly by exciting production of such hormones. These authors then further report that they have studied the content of vitamin A and total carotinoids in the blood of chronic arterial hypertensives and have found a low content of this vitamin. Sixty-five cases are reported as being treated. The dose was 180,000 international units daily for two weeks followed by maintenance dose of 90,000 international units daily. A drop in blood pressure was noted as long as the medication was continued. The hypotensive action of this medication was then declared to have been "not only undeniable but remarkable." Only four out of

From the Department of Medicine, University of Minnesota.

RESULTS OF TREATMENT IN TWENTY CASES

No.	Name	Before Treatment		After Treatment		Change	
		Average Systolic Blood Pressure	Average Diastolic Blood Pressure	Average Systolic Blood Pressure	Average Diastolic Blood Pressure	Systolic Blood Pressure	Diastolic Blood Pressure
1	J. J.	174	110	177	114	+ 3	+ 4
2	S. Y.	158	107	134	80	—24	—27
3	A. G.	179	101	161	91	—18	—10
4	E. O.	163	106	188	115	+25	+ 9
5	M. F.	196	119	213	118	+17	— 1
6	C. S.	240	136	229	133	—11	— 3
7	A. H.	233	116	250	130	+17	+14
8	F. L.	198	122	211	123	+13	+ 1
9	B. W.	212	116	216	113	+ 4	— 3
10	J. M.	198	100	201	101	+ 3	+ 1
11	H. A.	170	110	171	111	+ 1	+ 1
12	L. C.	190	102	177	94	—13	— 8
13	M. C.	210	105	206	109	— 4	+ 4
14	O. H.	235	97	229	120	— 6	+23
15	A. D.	170	104	172	103	+ 2	— 1
16	H. F.	206	108	199	108	— 7	± 0
17	H. M.	180	118	177	100	— 3	—18
18	J. S.	203	110	205	110	+ 2	± 0
19	W. S.	242	127	239	129	+ 3	+ 2
20	A. F.	200	110	206	110	+ 6	± 0

sixty-five cases and these of malignant hypertension were not benefited.

This report is on the result of the use of vitamin A in large doses in twenty cases of hypertension followed at the University of Minnesota. These patients were not selected. They were taken consecutively. Their chief complaints were headache, dizziness, and dyspnea on exertion. They were not decompensated. No marked coronary diseases were included in this series. These cases were given capsules containing 50,000 international units of vitamin A each. 200,000 international units of vitamin A were given daily. This dosage was continued for two weeks and followed by a maintenance dose of 100,000 international units daily. The average period of treatment was eight weeks. There were six males and fourteen females. Ages varied from thirty-one to sixty-nine years. The average period of known hypertension was seven and one-half years. In all cases many blood pressure readings were taken to get an average and all readings were taken under similar circumstances before and after treatment. Subjectively, six patients said they felt better but this improvement had no apparent relation to the blood pressure. The trend of readings as shown in the table, did not give evidence of any action on blood pressure whatsoever. Our findings did not corroborate the reported hypotensive action of vitamin A.

The systolic blood pressure determination of these twenty hypertensive patients after treatment was of a higher average in eleven cases and lower in nine cases. The diastolic blood pressure was of a higher average in nine cases, lower in eight cases and the same in three cases. There was no striking evidence of any changes in blood pressure following therapy other than the usual variations in readings.

Summary

Vitamin A* in doses up to 200,000 international units daily for two weeks followed by 100,000 international units daily for six to twelve weeks did not have any significant effect on the blood pressure determination of twenty hypertensive patients.

*Vitamin A furnished through the courtesy of J. B. Roerig and Co., Chicago, Illinois.

References

1. Herfort, Karel: L'influence de la Vitamine A sur la Sécretion Externe du Pancréas. Acta Med. Scand. 96:425, 1938.
2. Peña, J. Govea and Villaverde, M. Treatment of permanent arterial hypertension with large doses of vitamin A. Revista Cubana de Cardiologia, 2:5, 1940.
3. Peña, J. Govea y Villaverde, M.: Acciónica Hipotensora de la Vitamina A: Crónica Médico-Quirúrgica, Habana, 1:9, (Oct.) 1939.
4. Peña, J. Govea y Villaverde, M.: La Vitamina A y su Acción Hipotensora. Vida Nueva, Habana, 5:178, (Sept.) 1940.

CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL

A. J. Hertzog, M.D., and S. V. Lofsness, M.D.
Pathologists

Presentation of a Case

Dr. Petit: The case this morning is that of a white man forty-eight years old who was admitted to the Medical Service of this hospital for the first time on February 16, 1943. His present illness began three days before admission when he noted fever, malaise, anorexia and cough. Within a few hours he began to have chilly sensations and felt feverish. His coughing increased and he began to raise a small amount of blood-streaked sputum. His breathing gradually became more labored, and he noticed sharp pain in his right chest associated with respiration to some extent. During the evening of February 16 his temperature rose to 105 degrees, so he was brought to this hospital. His past history is of importance in that he stated that he had had heart disease for twenty years. A physician examined him and told him he had a murmur, and since then he has been taking digitalis. He has had intermittent palpitation and mild shortness of breath on exertion, but has never had edema of his legs. He operated a small restaurant until one year ago, but since then has been unemployed. However, he was active until a few days ago, and his cardiac symptoms have remained mild. He stated that he has never had rheumatic fever or syphilis.

On admission his temperature was 103.8 degrees, his pulse rate 100, respiratory rate 24 and blood pressure 150/74. He was flushed and dyspneic, coughed frequently and appeared seriously ill. Examination of the head and neck was essentially negative. His heart appeared to be markedly enlarged and its rhythm was totally irregular. A loud rough systolic murmur was heard over the entire precordium, especially over the aortic area, and it was transmitted into the neck. A systolic thrill was palpable at the base of the heart, and a high pitched early diastolic murmur was audible to the left of the upper part of the sternum. His venous pressure was 9 cm. of water. Crepitant râles were heard throughout the left lung field, especially over the upper lobe, and in this region the breath sounds were diminished and of bronchial type. There were a few scattered râles and rhonchi over the right lung. His abdomen was moderately distended and tympanitic, but was not tender and no masses were felt. Rectal examination was negative, and no abnormalities were noted in his extremities. A tentative diagnosis of left upper lobar pneumonia and rheumatic heart disease was made.

Laboratory studies revealed the following information: Hemoglobin 90 per cent (Sahli); leukocyte count 10,500 with 68 per cent neutrophiles; Kline negative; and urinalysis negative. A sputum sample contained pneumococcus type IX. A cardiogram showed left preponderance, auricular fibrillation and changes in the T-waves suggesting myocardial damage. An x-ray of his chest showed a large heart of the left ventricular type, and extensive consolidation of the left upper lobe.

He was given 4 grams of sulfathiazole, followed by one gram every four hours. He had been taking one grain of digitalis daily and this was continued. Shortly after admission he was placed in an oxygen tent. After 12 hours his temperature fell to 101 degrees, but the next morning it again rose to 103 degrees and remained high until his death. He gradually became more dyspneic, râles were heard over both lungs and he died on February 19, 1943, three days after admission. A blood culture drawn on the last day was negative.

Dr. Hertzog: This man had pre-existing heart disease and developed lobar pneumonia from which he failed to recover. Dr. Peppard, have you any comments?

Dr. Peppard: This man evidently died from lobar pneumonia. We still have an appreciable death rate from that disease, especially in people with complicating diseases and in the older patients. If this man had been seen earlier, he might not have died. Recently, in this hospital, we have had several deaths from lobar pneumonia in men who were chronic alcoholics and had fatty livers. It is well known that they have markedly reduced resistance to infection. This patient had an associated heart disease. From the story, it was probably an aortic lesion, with stenosis and insufficiency. He may have had an associated mitral deformity—many of them do. He gave no history of rheumatic fever, but that is true of many persons with rheumatic heart disease.

Dr. Hertzog: Dr. Arthur will now present the autopsy findings.

Dr. Arthur: The most interesting findings were in the chest. The left lung weighed 920 grams. Its upper lobe was firm, red and airless; pus could be expressed from the small bronchi. The lower lobe was only slightly congested. The right lung weighed 1030 grams. It was diffusely congested and edematous. Each pleural cavity contained approximately 200 c.c. of cloudy tan fluid.

When the breast plate was removed, it was noted that the internal mammary arteries were significantly dilated. A finger was inserted into the aorta through a small incision and an obstructing lesion was felt in the arch. The pericardium was slightly thickened and fibrous with a few thin calcified plaques, and it was densely adherent to the heart. It was also firmly adherent to the medial surface of the left lung and to the diaphragm. The pericardium, heart and great vessels were removed together, and the heart is esti-

(Continued on Page 384)

HISTORY OF MEDICINE IN DODGE COUNTY

BY JAMES ECKMAN

Rochester, Minnesota

and

CHARLES E. BIGELOW, M.D.

Dodge Center, Minnesota

(Continued from March issue.)

Milton Township, named for John Milton (1608-1674), was organized on May 20, 1858,[5] and **Dr. John Quincy Adams Vale** (1825-1903), who eight years previously had been practicing medicine in Meigs County, Ohio, was elected first chairman of the board of supervisors. He was reëlected to this post in 1859.[5] Doctor Vale was in every respect a pioneer, and had been in Pine Island in 1855, but how he happened to be in Milton Township in Dodge County in 1858 is not known. He moved to Homer in Winona County in 1861, and there he died on September 3, 1903, as will be shown later.

Indians inflicted neither death nor injury on the pioneers of Dodge County, for by the time the settlers arrived the red man had been driven far to the west, except for a few occasional bands of wandering savages who were beggars rather than marauders. Yet, if one story can be believed, Dodge County was the first to learn that the fearful massacre of 1862, in which **Dr. Otis Ayer** (1817-1889,[23] **Dr. Asa Wilder Daniels** (1829-1923),[24] Dr. **Jacob W. B. Wellcome, Sr.** (1825-1906)[25] and others rendered such signal medical and surgical services, was contemplated by the Sioux. An old resident of Dodge County once recalled:

> In February, 1862, a Winnebago and his family stopped with us over night, on their way to Wisconsin. In his broken dialect he said to us: "Sioux kill white man! Sioux kill Winnebago! Grass—pony—eat!" By questioning we ascertained that what he wished to communicate was, that when the grass had grown sufficient for their ponies to live, the Sioux were coming to kill the white men and Winnebagos, and he and his family were fleeing from what we then thought imaginary danger, and so gave his story no particular credence; yet it proved to be the first intimation of the terrible massacre which occurred the following summer.[14]

The War and the Railroads, 1860-1870

The tempestuous years immediately preceding the War of the Rebellion and those of the war itself seem not to have deterred physicians from locating in Dodge County. **Dr. John Jacob Everhard** (1829-1908), a graduate of the Rush Medical College of Chicago in the class of 1856, settled in Mantorville in 1860, and remained there until 1874. One of his first patients when he arrived in the town was a person who had been bitten by one of the rattlesnakes previously mentioned. Doctor Everhard was joined two years later

by **Dr. Jasper Bedient** (1838-1920), a native of New York State who had been graduated from the Berkshire Medical College of Pittsfield, Massachusetts, in the class of 1860. Doctor Bedient settled in Mantorville, but he was to spend most of his life in Kasson.

In certain sections of Dodge County there was opposition of some degree to the draft during the War of the Rebellion, but the services of the county's physicians in this war seem to have been creditable. Only one, so far as is known, gave his life in the struggle. This was Dr. Augustus O. Potter of Mantorville, who had come to that town before the outbreak of the war, as previously mentioned. He joined the Sixth Minnesota Regiment of Volunteers as assistant surgeon. The Adjutant General's Office of the War Department[26] has reported that Dr. Potter died of disease at Helena, Arkansas, on September 13, 1864. He was an unusually skilled physician and surgeon, and was reputed to have risen rapidly in the army.

Dr. Edward P. Kermott, then of Wasioja, enlisted in Company C of Dr. Potter's regiment in 1864. He served as a private soldier, but before he was mustered out he was promoted to the rank of corporal, as will be shown later.

Doctor Dartt also enlisted as a private soldier. Eventually, he gained the rank of captain of his company. He served in Company A of the Fifth Minnesota Regiment of Volunteers, formed in May of 1862. He thus took part in such events as the Siege of Corinth and the Battle of Iuka; but he resigned his commission on April 12, 1863, because of poor health, and returned to Mantorville. So far as is known, he never again practiced medicine, but turned his interest toward farming and other pursuits.

Dr. James A. Garver served with Indiana regiments, as will be shown later.

Dr. James Mansfield Ryder served in the War of the Rebellion as a private soldier in the Fifth Minnesota Regiment of Volunteers. He was discharged for disability in December of 1862, and returned to Milton Township.

Doctor Everhard remained in the county during the war. It is believed that he had not been able to satisfy the requirements of the physical examination, for some reason.

The melancholy medical history of one resident of Dodge County during and after the War of the Rebellion has been recorded, and it is quoted as it was written:[27]

> He had been struck by a bullet in the left groin, and after cutting the neck of the bladder and crushing through the pelvis bone, it lodged in the right hip. For eight days our boys lay on the field, suffering, in addition to their wounds, the pangs of thirst and starvation. After staying a few days at Centerville, Mr. White proceeded to Fairfax Seminary hospital, and was discharged in November. He then went to Rochester, New York, to visit relatives and secure treatment from a noted surgeon there. The wound was now partially healed, but the doctor proceeded to enlarge it so as to remove the pieces of bone. Before this could be accomplished the doctor was prostrated by a long attack of fever. As neither physician nor patient had faith in the skill of others, the wound was healed before the former recovered. Thus it remained until August 26, 1866, the fourth anniversary of the wound, when the bullet was cut from the hip by the same physician, Dr. E. B. Moore.* In 1883 Mr. White was again forced to submit to the surgeon's knife, a stone having formed in his bladder around a fragment of bone floating there. This was removed at Rush Medical College, in Chicago, and he is now [1884] enjoying better health than ever before since his injury.

*The physician referred to above probably was Dr. Edward Mott Moore (1814-1902). He was the most famous surgeon in Rochester, New York, from 1840 until about 1890, and was professor of surgery in several Eastern colleges as well as in the old Starling Medical College of Columbus, Ohio. In 1890 he was elected to the presidency of the American Medical Association, and he had already served as president of the Medical Society of the State of New York.

This apparently was an instance in which a settler of Dodge County forsook the practitioners of his own community for those of the East (or at least, Chicago). The patient had settled in Kasson in 1866.

Dr. Reuben Willson (1822-1900) was a veteran of the War of the Rebellion who came to Mantorville in 1866, where he remained for about ten years.

Dr. James McLaughlin (1816-1883), a North of Ireland man, came to Mantorville in 1866 from Beaver Dam, Wisconsin. He was wealthy, affable and highly educated,[1] so that although he had practically retired from the practice of medicine by the time he came to Dodge County, he was much sought by other physicians in the county for consultation.[1]

A **Doctor Dearborn**, a woman physician, apparently was practicing medicine in Wasioja in 1866. It has been recorded,[28] for instance, that "Dr. Dearborn of Wasioja" assisted **Dr. William Worrell Mayo** (1819-1911) of Rochester at an operation for ovarian tumor in August of 1866, but little more is known about her. Woods,[13] who was able to remember her, said she was a large, determined woman who always carried a pistol, and added that "She did not last long." It would be difficult, of course, on the basis of the slight evidence available, to say that she was a Doctor of Medicine, although it certainly would not have been impossible for her to obtain such a degree in the sixties.

Next to the War of the Rebellion, the one great event of the sixties which affected the life of everyone in the state was the coming of the railroads to Minnesota.* No one was free from the effects of this tremendous development. As Folwell[29] wrote:

> As the railroad lines extended, the prairie schooner, the stagecoach, and the steamboat lost importance. The steam cars ran every day and their arrivals and deliveries were punctual. Journeys of days were shortened to hours. Grain and dairy products, which previously could stand but fifty or sixty miles of transportation to primary markets, could now be hauled hundreds of miles, and heavy commodities like coal and lumber could be shipped out in return. The movement of merchandise and mails was greatly expedited . . . The old river counties and those next behind them received goodly additions and population now flowed past them into the "back counties."

Dodge County at this particular time was a "back county," and the physician in Dodge County was affected no less than his fellow settlers by the coming of the railroads. For him the significance of the railroad was twofold: it provided him with a speedy and comfortable means of obtaining skilled assistance in times of dire need from those physicians and surgeons in Saint Paul and Minneapolis who were beginning to specialize, but it also permitted his wealthier patients to seek the professional services of well-known practitioners in far-distant metropolitan centers, as in the case of the Kasson man, previously mentioned herein, who went to the Rush Medical College of Chicago in 1883 for a surgical operation. If the railroad enabled the country physician to journey to Eastern cities at his leisure to acquaint himself with new techniques and additions to medical and surgical knowledge, it also enabled Eastern physicians or those relatively nearer to penetrate to the rural physician's village periodically, there to remain for a short while and collect respectable fees which otherwise would have gone into the pocket of the resident physician. The railroad enormously

*Undoubtedly, the Sioux Indian outbreak of 1862 aroused much consternation and alarm in Dodge County, and it is known that men from the county went to the assistance of the beleaguered settlers in Western Minnesota. It is also true that the Legislature in February of 1860 had memorialized Congress to protect settlers on the frontier "from the aggressions of the Sioux Indians" by the erection and investiture of a fort thirty miles west of the junction of the Pembina and Red Rivers, and by the re-occupation of Fort Abercrombie, built in 1858 and shortly thereafter abandoned, at Graham's Point. But the territory in which these points were situated was far distant from that in which the uprising of 1862 occurred. See: General Laws of the State of Minnesota, etc., etc., Faribault, Orville Brown, State Printer, 1860, pp. 304-305 and 310-311.

simplified the problem of the young medical graduate who wished to try out a location, even as it simplified one of the problems of the established practitioner by bringing him drugs, instruments and other supplies from the East, much more rapidly than he had ever dreamed possible.

Kasson in Dodge County is an example of a town built by a railroad; in this case, the Winona and Saint Peter Railway Company (now the Chicago and Northwestern Railway Company), in 1865 and 1866. The first passenger train reached Kasson in November of 1865.[17] The town of Kasson itself was laid out by and named for Jabez Hyde Kasson (1820-1891), a Pennsylvanian who had come to Dodge County in 1856.[17]

"Two years ago," the *Dodge County Republican*[30] of Kasson exulted in its second issue, "the site of this village was a beautiful spot of wild prairie, in a sparsely settled region. It now contains a population of nearly 400 and is rapidly increasing in size, wealth and importance."

One week later the same newspaper declared that Kasson presented a good opening for a competent physician, and in the next issue it was observed that a Doctor Willson from the East proposed to settle in Kasson.[31] On September 7 of that year (1867) the professional card of this physician appeared in the same newspaper. He was **Dr. John B. Willson,** an older brother of Dr. Reuben Willson. He was a graduate of the old Castleton Medical College* of Castleton, Vermont, and is believed to have been an aged man by the time he reached Kasson in 1867. He left Kasson in the summer of 1874. It is believed that he went to California, and that he did not resume the practice of medicine. He was known as an able, well-educated and experienced physician.

As the Winona and Saint Peter Railway Company built the town of Claremont, so also did it obliterate the hamlet of Rice Lake, on the north shore of the small lake of the same name in Dodge County. The settlement had been platted in 1856, and it had a post office, blacksmith shop, church and a few stores and houses. It was in this village that the veteran eclectic physician, Dr. Edward P. Kermott (1825-1872), practiced for a while in the fifties, as previously stated.

It was recorded that Doctor Kermott was in Rice Lake in 1857. Nine years later the Winona and Saint Peter Railway Company crossed Dodge County from east to west, and a railway station was erected at a point some five miles south of the village of Rice Lake. The population of Rice Lake naturally shifted to the site of the new railway station, which became the village of Claremont, incorporated in 1878.[17] Today only a church marks the original townsite of Rice Lake.

Wasioja was another town in Dodge County which was ruined by the railroads. At one time peopled by no less than 1,000 souls, Wasioja for years had hoped that the Winona and Saint Peter Railway Company would connect with the village in the sixties, but this did not come to pass. Hopes again were high in the seventies. "If the Dubuque & St. Paul railroad passes through Wasioja, as the citizens of the town fondly hope," it was written,[5] "it will form a junction with the Winona & St. Peter road at this point [Dodge Center]." These hopes likewise were dashed to earth.

Hence, Wasioja, which had been platted in 1856, which had opened in 1860 the Minnesota Seminary, a Free Will Baptist institution of learning known throughout the entire state, and which was recognized far beyond the county for its famous "Wasioja stone" quarries, declined rapidly. Today it is scarcely

*For an interesting account of this old medical school see: Waite, F. C.: Birth of the First Independent Proprietary Medical School in New England, at Castleton, Vermont. Ann. Med. Hist. 5 (n.s.): 242-252, (May) 1925.

more than a "ghost town," brooding in sepulchral stillness over its once sanguine destiny.

Other towns in Dodge County were similarly affected by the railroads. It was written:[32]

> The rapidity with which some of these station villages grew was often marvelous and always very agreeable to lucky proprietors. The order in which there rose about the railroad "depot" the elevator, the store, the blacksmith shop, the saloon, the school, the church, and the post office became almost stereotyped. In a single season all these would sometimes appear. The development of these railroad towns was disastrous to many older villages, platted at what seemed to be points of vantage. In some cases, when these were not too far from new towns at the railroad stations, they were literally put on wheels and moved thither. Some well-built towns farther away . . . were gradually deserted and their buildings afterwards actually rotted down.

There was by this time a respectable number of physicians in Dodge County. Some were superior physicians who could have maintained a fine practice anywhere, city or rural region. It would be logical to suppose that some sort of medical organization would be formed within the county, but the first society of which the authors have record was not founded until 1869.[33] It will be considered in more detail later.

The first railway train to reach the new town of Dodge Center arrived at that place on July 13, 1866.[17] In the late spring or summer of 1867 **Dr. D. L. Tyler**, who had been living in Ashland, opened a general store at the new railway town,[5] where he became postmaster in the same year. It was reported[34] in the summer of 1868 that "Dr. Tyler is doing a fair small trade in notions. He wears his honors as postmaster with dignity." In 1871 it was said that he was engaged in the manufacture of the "German Rat, Mouse and Insect exterminator."[35] It should be pointed out that an old resident of Dodge Center, Dennis Lynch,[36] said he remembered Tyler well, but did not recall that he ever practiced medicine, and did not believe that Tyler was a regularly graduated physician.

A history[5] of Dodge County printed in 1870 contained a full-page advertisement of Tyler's store, which was represented as being situated at Dodge Center. An excerpt from this advertisement follows:

> D. L. TYLER
> General Dealer in
> DRY GOODS
> and
> GROCERIES
>
> Boots and Shoes, Hats and Caps, Yankee Notions, Drugs and Medicines, Crockery and Glassware, Toilet Articles, Perfumery, &c.

This man apparently was the Dr. D. L. Tyler mentioned above. He seems to have been an earnest merchant, for he informed his readers that:

> My shelves are always filled with a GENERAL ASSORTMENT of all things Useful and Ornamental, and, like the accommodating Yankee, if I have not got what you want I will get it. I am bound to supply my customers with what they want
>
> AT CHEAP RATES!
> DODGE CENTER - - - MINN.

The subsequent history of this man is not known, but he was still living in

1885.* Lynch[36] believed he went to Dundas, Minnesota, and that he there opened a general store. It has not been possible to trace his relationship to medical practice in Dodge County, and the authors are not able to say whether or not he was a Doctor of Medicine.

The year 1868 in Dodge County seems to have been a tranquil prelude to the gale that was to break only a few years later. The summer was reported as being salubrious; Dr. John B. Willson of Kasson had so few patients that he amused himself by gardening. In September the *Dodge County Republican* of Kasson was replete with advertisements of Wahoo Bitters, Indian Saguwa, Indian Root Pills, Hoffland's German Bitters, Coe's Cough Cure and Coe's Cough Balsam, as well as the Galenic Medical Institute of Saint Paul, of which Armstrong[37] has written.

At some time in 1868 **Dr. Charles Severin Beaulieu** (1835-1896) settled in Concord. He seems to have been a curiously erudite man who could practice medicine or occupy a pulpit with equal facility. Doctor Beaulieu came to Dodge County from Indianapolis, where he had practiced medicine since his discharge from the Union armies in either 1863 or 1867. He remained in Concord until November of 1880, at which time he responded to a call which took him to Brownsdale in Mower County as pastor of the Christian Church there.

The name of **Dr. Charles Lee,** an eclectic physician, stimulates what must remain conjecture, for the details of his rather turbulent career are not clear. He was married to Emma Higbe (1847-1874) of Concord Township on September 30, 1867, and at that time he was said to have been a young man. In February of 1868 it was announced in the *Dodge County Republican* of Kasson that Doctor Lee would be at his "old office" on Main Street in Kasson on Saturdays, a statement that would imply that he had practiced in Kasson before that year. An "A. H. Lee, M.D.," was listed in a directory of Wasioja, contained in a history[5] of Dodge County that was issued in 1870, and this no doubt was Dr. Charles Lee, for there was no other physician with this surname in the county at the time. In a work[38] issued in 1937 it was said that Doctor Lee was the only physician in Claremont for the first five years of that town's existence, but that during part of this time he lived at Wasioja. He is known to have been living in Claremont with his wife in 1869. It was in 1869 that he was elected treasurer of the Minnesota State Eclectic Medical Society, founded at Owatonna on May 26, 1869.[39] An old resident of Claremont declared that as a boy he had suffered a fractured leg, for treatment of which Doctor Lee was called from Owatonna, where he was supposed to have been living at the time.

In its issue of January 28, 1870, the *Dodge County Republican* of Kasson printed a business directory of the town of Dodge Center. In this directory Dr. Charles Lee was listed as the only physician in Dodge Center.

The only Charles Lee licensed to practice medicine in Minnesota was **Dr. Charles Edward Lee** (1842-1918), who was graduated from the Medical Department of Columbia College of New York City in 1866. On the basis of these dates, it would have been possible for Doctor Lee to be in Wasioja in 1867, as noted above. This Doctor Lee was licensed to practice medicine in Minnesota on October 11, 1883;[40] he practiced in various towns in Minnesota before he moved to Saint Paul, where in 1890 he attended **Dr. P. Sprague Haskell** (1832-1890) of that city during his last illness. Doctor Haskell died in Saint Paul on September 26, 1890.

*He visited Kasson on April 23, 1885. The *Dodge County Republican* of Kasson in its issue of April 30, 1885, observed: "D. L. Tyler, Esq., the first postmaster and merchant of Dodge Center, visited Kasson on Thursday last, for the first time in twelve years. We acknowledge a call."

Dr. Charles Edward Lee became a member of the Minnesota State Medical Association in 1903, and at the time was still living in Saint Paul. He died suddenly in his office in Los Angeles, California, on April 23, 1918.[41] It seems likely that he was the Doctor Lee who was in Dodge County in the sixties, although this is not certain.

In September of 1869 the Dodge County Medical Society was founded.[33] This society may have been only intermittently functional, but it nevertheless endured until 1934, as will be set forth later.

(To be continued in April issue)

All references will appear at the end of the completed chapter.

ARMY'S 1943 RECRUITING PROGRAM WILL REQUIRE 6,900 PHYSICIANS

The 1943 recruiting program of the Surgeon General of the Army calls for the commissioning of 6,900 physicians and approximately 3,000 hospital interns and residents, it is reported in *The Journal of the American Medical Association* for March 13 in an outline of the new procedure of processing physicians, dentists and veterinarians for the Army. The program also calls for the commissioning of 4,800 dentists and 800 veterinarians.

Physicians will be procured from the following twenty states and the District of Columbia: California, Colorado, Connecticut, Illinois, Iowa, Maryland, Massachusetts, Minnesota, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New York, Ohio, Oregon, Pennsylvania, Rhode Island, Vermont and Wisconsin.

The following states have already contributed more physicians to the armed forces than the sum of their 1942 and 1943 quotas and will not be called on to furnish any more physicians, except interns and residents and except special cases for specific position vacancies, during 1943: Alabama, Arizona, Delaware, Georgia, Idaho, Kentucky, Louisiana, Mississippi, New Mexico, North Carolina, South Carolina, Tennessee, Texas, West Virginia and Wyoming.

It is stated that at present there will be no procurement of physicians, except interns and residents and in special cases for specific position vacancies, in those states not listed above. There will be no procurement of dentists, except special cases for specific position vacancies in the following sixteen states: Alabama, Arizona, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Mississippi, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, Texas and Virginia.

At the present time there are no restrictions on the recruiting of veterinarians.

In the instructions issued by the Army it is pointed out that the Surgeon General has discontinued all medical officer recruiting boards and that under the new procurement program no physician, dentist or veterinarian will be commissioned in the armed forces of the United States until he has been declared "available" by the Procurement and Assignment Service of the War Manpower Commission.

In each state the Procurement and Assignment Service has set up three state chairmen: medical, dental and veterinary. Each of these prepares a monthly quota list of physicians, dentists and veterinarians who are apparently suitable and who are available, for commissioning in the Army of the United States. This list is submitted to the central office of the Procurement and Assignment Service which sends a communication inviting such individuals to apply for service with the armed forces. On the reply card enclosed with the invitation the individual states his preference for the Army, Navy or Medical Department of the Air Forces. These reply cards are sent by the potential applicants to the state chairmen of the Procurement and Assignment Service who in turn submit lists of such potential applicants to the Officer Procurement Service of the Army.

On receipt of such lists the officer procurement district office contacts the potential applicant and arranges for an interview regarding a commission.

Applicants will be requested by the officer procurement district office to complete all papers and take all steps required of them within fourteen days of the date of such request. If this is not complied with, a report thereon will be transmitted by the officer procurement district office to the state chairman of the Procurement and Assignment Service.

The decision as to the grade and appointment to be recommended for each candidate rests with the Surgeon General, not with the Officer Procurement Service.

President's Letter

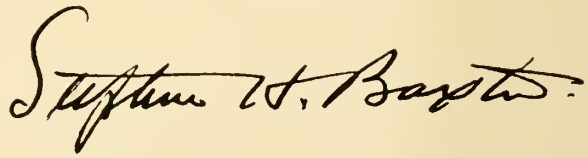
MODERN three-dimensional warfare has made obsolete the old conceptions of warfare with a front line of combat, a more or less inactive intermediate zone and, far to the rear, areas in which the devastation of war is not directly felt. Any part of a nation at war may now become at any time an area of actual combat. The medical profession fully realizes this possibility, and for that reason, it is in no mood of "business as usual" that our Association meets this year in its 90th annual convention.

The importance of the "home front," under these conditions, is recognized not only by civil, but by military authorities, and special dispensations are made for physicians caring for the civilian population. Many conventions of national scope have been discontinued for the duration, but the holding of local and state medical meetings is not only approved but encouraged.

It is the privilege and the duty of the members of our Association, as many as can possibly do so, to attend the convention. There is an enthusiasm in numbers, a "summation of stimuli" which varies in direct proportion to the number of persons present. This is your meeting. The Program Committee, the officers of the Association and the committees of the Hennepin County Medical Society are united in the effort to make it interesting, stimulating, refreshing. It presents attractions and features which, in the language of a well-known document, are "yours to enjoy, yours to preserve, yours to transmit" to your neighbors who unfortunately cannot be present.

In the week following the convention a Course in Radiology is offered at the famous Continuation Center at the University of Minnesota. Here a physician enrolled in the course may live at nominal cost in a building built and equipped in a manner that compares favorably with an exclusive private club, and he may pursue his studies under the most pleasant and stimulating conditions.

It is none too soon now to lay plans for taking advantage of one or both of these opportunities. Prepare to contribute something to the meeting of your Association, if only your presence and enthusiastic interest. Your own mental stimulation and the contribution it will make to the maintenance of morale on the "home front" will amply justify such a meeting even in time of war.



President, Minnesota State Medical Association

Editorial

Carl B. Drake, M.D., *Editor;* George Earl, M.D., Henry L. Ulrich, M.D., *Associate Editors*

PNEUMONIA TODAY

While pneumonia in Minnesota never had the high mortality that was experienced in the Eastern states, yet, until recently, it was one of the major causes of death. Not so long ago patients suffering from this disease were placed outdoors, even in zero Minnesota weather, with the mistaken idea that "fresh air" was good treatment even though cold. It eventually was realized that cold air is irritating to an inflamed respiratory tract, and fresh but not cold air is indicated. Nursing and a sedative constituted the essential treatment.

Pneumonia serum for pneumococcic forms of pneumonia constituted a great advance in the therapy of the disease and reduced the mortality at least 10 per cent. The serum, of course, was ineffective for the bronchial types of pneumonia complicating influenzas, measles, whooping cough and respiratory infections. Then came the sulfa drugs which proved themselves highly effective in pneumococcic pneumonia and have replaced serum therapy. Perhaps we were unduly optimistic in thinking that the sulfa drugs would be as effective in that group of pneumonias not caused by the pneumococci. It has come to be recognized that they are not effective in a large group of pneumonias the causes of which we do not know.

In this issue we are publishing an article on "Atypical Pneumonia" by Dr. Wesley W. Spink who has interested himself in the subject of pneumonia and also in that of the sulfa drugs. He emphasizes the fact that the organism which is the etiological factor in many cases of pneumonia is unknown and cannot be determined even with the aid of a first-class laboratory. Many are atypical and lack the textbook physical findings.

A real value of Dr. Spink's article to the practitioner is the point that sulfadiazine or sulfathiazole should be given at the onset of an acute infection suggesting pneumonia, but if after forty-eight hours there is no improvement in the symptoms it should be discontinued, for one is probably dealing with a pneumonia unaffected by the drugs and further administration is likely to confuse the picture and do more harm than good. The same may be said for the prolonged use of these valuable drugs for other infections and the profession should be alive to this danger.

THE ORR TREATMENT OF COMPOUND FRACTURES

While Dr. H. Winnett Orr of Lincoln, Nebraska, may not have been the originator of the closed cast treatment of compound fractures, he was responsible for proving its value and the method is one of the few progressive steps which can be placed on the credit side of World War I, medically speaking.

His method consists, briefly, in cleansing a compound fracture with soap and water, shaving the skin and treating it, but not the wound, with a weak tincture of iodine, debridement, the application of vaseline gauze and a closed plaster-of-Paris cast. Infection is given secondary consideration to absolute rest of the injured parts.

The profession has been admittedly slow in adopting this revolutionary method in the treatment of these wounds which in most cases are infected. Many a surgeon has felt that he would be laying himself open to a suit for malpractice if he used the treatment. Nevertheless, the method has been generally adopted by the military forces and was used to advantage at Pearl Harbor.

In the March number of *Harper's* appeared an article by Leigh White entitled, "Dr. Orr Packs Them in Plaster." While in Greece Mr. White sustained a severe compound fracture of the femur and ten days elapsed before he received any surgical care. He feels he was poorly treated for many months until he sought the services of Dr. Orr in Lincoln. His article relates the story of the Orr treatment and Dr. Orr's difficulties in having his method generally recognized.

The profession, as a rule, has been conservative in the adoption of new ideas in medicine. We were very slow in accepting Pasteur's discovery of

the part played in disease by micro-organisms, Jenner's discovery of vaccination against smallpox, Reginald Fitz's conception of appendicitis, Herrick's description of coronary thrombosis. New ideas which represent medical progress, however, are eventually recognized.

A certain amount of conservatism is a professional asset. Many new ideas and methods do not stand the test of time. Among many such proposals are: twilight sleep, Potter version, thymus extract and various serums recommended for carcinoma, dinitrophenol for reducing weight, intensive chemotherapy for syphilis and staphylectomy for the prevention of the common cold. Other therapeutic measures which have some value but must be used with care are gold salts in arthritis and pituitrin in obstetrics. We are not at all sure but what continuous caudal anesthesia in obstetrics should be placed in this latter group. The added expense incident to this procedure and possibly an increased hazard may prove it inapplicable for general use.

New and untried medical procedures should be presented first to the profession for consideration and trial. Articles on new and unproven medical procedures have no place in newspapers and lay periodicals. This applies to the *Harper's* article on the Orr treatment of compound fractures. The article gives the impression that the profession at large is unprogressive and not receptive to new ideas. Recent medical progress refutes the implication.

AMA LEGISLATIVE ACTIVITY

IT is hoped that every one of our members will read the article entitled "The Doctor of Medicine and His Responsibility" by Dr. Alfred W. Adson of Rochester, which appears in this issue of MINNESOTA MEDICINE. Dr. Adson brings out very clearly the need for a more active part in national and state legislation in matters pertaining to medicine and public health. Anyone who has followed the trend of proposed legislation in Congress by other than medically minded individuals can realize that advice from the medical profession is sorely lacking. This is a responsibility which rests on the medical profession of the country.

Many state medical organizations, our state medical association for one, have seen the need and have accepted the responsibility of advising state legislators in medical matters, to the bene of public health and public economy. The ne for an active policy on the part of medical men informing the public regarding medical matte has been appreciated for some years. The AM has been active in publicizing the science of me icine and the publication *Hygeia* is an example such activity. To add to this activity the Nation Physicians Committee was formed and has do extensive and valuable publicity work. There a growing feeling that mere publicity is n enough; that our national association should active in Washington just as our state associ tions are active in state capitols.

As Dr. Adson says, the statement of Justi Miller of the United States Court of Appea that it was perhaps the failure of professiona groups to guide legislation which was responsib for the untoward outcome in the case of th United States of America versus the America Medical Association, constitutes a direct challeng to the physicians of the country to take an inte ligent, helpful and fair stand in the enactmer of legislation that concerns the public welfar and the welfare of medicine itself. This wa pointed out some time ago by the National Phy sicians Committee. The question is now raise whether representatives of the AMA with th prestige of the national association behind then and assigned to Washington are not the logica ones to accept this challenge.

It should be explained that two reasons hav been advanced why the AMA has been ham strung in meeting the need for adequate represen tation in Washington. The first explanation give is that the constitution and by-laws of the AM would not permit it, and the second justificatio given is that to do so would subject the AMA t a Federal income tax. To us there is no merit i either one of these positions. In the first plac Article II of the Constitution of the AMA pro vides: "The objects of the Association are t promote the science and art of medicine and th betterment of public health." We know of n sounder way of promoting "the science and ar of medicine and the betterment of public health" than to make available to national and state law-making bodies and to others, scientific data and sound medical opinion in reference to such matters.

With respect to the liability for income tax we are advised that the exemption contains the fol-

wing restriction: "Provided no substantial part the activities of which is carrying on propanda, or otherwise attempting, to influence legslation." Such an absurd restriction should ever have been passed in the first place, and we oubt that it would have passed had the various roups, including the AMA, who are concerned ith this matter, been on the job in Washington. owever, we are far from convinced that any ch activities, even though entered into, would onstitute a "substantial part of the activities" of e AMA. A careful reading of the exemption ction of the United States Internal Revenue aw fails to disclose any such restriction being ttached to labor unions, agricultural groups, raternal beneficiary societies, building and loan ssociations, business leagues, chambers of comerce, real estate boards, civic leagues and nuerous others. Apparently these groups were ell represented in Washington when such legisation was being drafted.

This law should be changed and if organizaons like the AMA are prevented from accomlishing this proper object, such an organization s a National Physicians Committee might well ttempt it.

ALFRED BLALOCK

DURING the second week in March, Dr. Alfred Blalock, Professor of Surgery and Director of the Department of Surgery of Johns Hopkins Medical School, spent three days on the campus of the University of Minnesota as the guest of the Medical School. On Thursday evening, March 11, 1943, Dr. Blalock gave the tenth E. Starr Judd Lecture in the Museum of Natural History Auditorium. The subject of Dr. Blalock's address was "Traumatic Shock with Particular reference to War Injuries."

During his stay, Dr. Blalock participated also in the postgraduate week in Surgery conducted under the auspices of Dr. William A. O'Brien, Director of Postgraduate Medical Training in the Continuation Study Center. Dr. Blalock held two Surgical Colloquia before the group of sixty-four physicians and surgeons who attended the postgraduate week in Surgery, discussing primarily: burns, myasthenia gravis and surgical diseases of the thorax, including bronchiectasis, adenoma of the bronchus, lung abscess, constricting pericarditis and patent ductus arteriosus. Dr. Blalock gave a lecture also on "Surgical Diseases of the Heart," reviewing his own extensive experience with these disorders. On Friday, March 12, Dr. Blalock participated in a two-hour seminar discussion with members of the faculty on "Problems of the Circulation," in which special consideration was given to shock and hypertension.

Everyone who had the opportunity to hear Dr. Blalock, including members of the postgraduate group, students and faculty alike, was most enthusiastic in praise of his presentations. Dr. Blalock is probably the keenest exponent of the experimental or physiological approach to clinical surgery in America. Dr. Blalock's visit to the Medical School will be long remembered, not alone for the critical character of his lectures and discussions; his innate modesty and winsome manner have gained for him an additional large number of ardent admirers.

These ten years of lecturers sponsored by the E. Starr Judd Lectureship in Surgery have brought to the Medical School some of the best surgical talent in America. Dr. Judd's benefaction has made an indelible impress for the better upon this medical community. The remembrance of so distinguished a son of Minnesota is a stirring stimulus to us all. Dr. Blalock's visit affords us again the occasion to cherish Dr. Judd's memory with pride, affection and gratitude.

BUY WAR BONDS

THIS month our government is putting on a drive to float several billion dollars worth of bonds. Banks and corporations are being given the opportunity to invest spare funds in these bonds. Individuals are being urged to do what they can in putting their spare dollars to work for Uncle Sam.

An amateur economist during World War I wrote in a prominent magazine to the effect that each generation pays the cost of its war. This was news to many and its fallacy will beccome evident from the taxation which will be required to pay interest on our national debt following the present war.

The cost of the present war will have to be paid somehow. Only a part of the billions required can be met by taxes—the remainder will have to be furnished by loans to the government in the form of bonds. Economy, wherever possible on the part of government and citizens, is of vital importance. Savings can find no better investment than in government bonds, not from a standpoint of immediate monetary return, but

quite possibly from a monetary standpoint in the future, for what would any investment be worth after the war if we do not win?

From the standpoint of personal selfishness, as well as patriotism, *buy war bonds.*

PHYSICIANS MUST VOLUNTEER FROM LARGER CITIES

Young available physicians in the large cities of the country, particularly in those of the eastern seaboard, whose failure to volunteer has caused a lag in the procurement of medical officers for the armed forces, should be called before the bar of public opinion, *The Journal of the American Medical Association* for March 27 declares in an editorial. *The Journal* says:

"At a recent meeting in Washington of the Directing Board of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians with the Officer Procurement Service of the United States Army and with representatives of other governmental agencies, evidence was clearly set forth that the procurement of medical officers for the armed forces is lagging. The responsibility rests unquestionably on the failure of young available physicians in the large cities of the country, particularly those of the eastern seaboard, to volunteer. Officers of the medical societies of New York, Massachusetts and Connecticut were present and the situation was placed before them. The rural areas of the United States have contributed doctors not only up to such quotas as were assigned to them but in many instances well beyond these quotas; it is simply impossible to anticipate that they will make a further contribution at this time. In the meantime, New York, Brooklyn, Boston and some of the larger communities in the states of Connecticut, New Jersey, Pennsylvania and California have failed even to approximate their quotas.

"The needs of armed forces for physicians during 1943 are well defined. The number of physicians to be expected from recent graduates, interns and those now holding residences has been determined. Beyond this number at least six thousand more physicians must come from the civilian population. The Procurement and Assignment Service for Physicians, Dentists and Veterinarians has devised a technique which involves, first, a determination of the availability of the physician concerned or his essentiality for any civilian position which he occupies; second, notification of the physician of his availability and a request that he appear before his local procurement board; third, a notification of the Selective Service Board of the fact that the physician concerned is considered available and that he has failed to volunteer. Thus far pressure beyond this has not been exercised. There remains, however, the mobilization of the pressure of public opinion.

"In some instances physicians have declared flatly to representatives of the Procurement and Assignment Service and the Officer Procurement Service that they do not wish to volunteer and that they will not volunteer. When it is known to other physicians in the community that a physician under thirty-eight years of age, declared available by the Procurement and Assignment Service, refuses to volunteer in this time of the nation's need, when many an older physician, frequently with innumerable obligations, has given up his home, his practice and the responsibilities of years to participate in this war, the public has a right to know that the younger physician is not willing to do his part. Certainly the Procurement and Assignment Service should consider the possibility at this advanced stage of the war effort of making public through the state medical journals not only the names of those who are already participating in the war but also the names of those who have been declared available and have not themselves ever indicated a willingness to participate. Let them be called before the bar of public opinion!"

CLINICAL PATHOLOGICAL CONFERENCE

(Continued from Page 372)

mated to weigh 800 grams. There is extensive fibrosis and slight calcification of both the mitral and the aortic valves so that they admit only a finger tip. In addition, there is an irregular soft vegetation 4 mm. in diameter on the posterior mitral leaflet. The tricuspid ring is dilated, measuring 15 cm. in circumference. Both ventricles are hypertrophied and all the chambers are somewhat dilated, especially the left auricle.

Two centimeters beyond the orifice of the left subclavian artery there is a thin septum across the aorta which has an opening 7 mm. in diameter in its center. The diameter of the aorta is moderately reduced in this region for about 3 cm. There is no evidence of the ductus arteriosus.

The only findings in the abdomen were two fresh red infarcts in the spleen; the spleen weighed 190 grams.

A smear was made from the vegetation on the mitral valve and it showed gram positive cocci.

DR. HERTZOG: As you can see, the internal mammary arteries are greatly dilated. They arise from the subclavian arteries, which are proximal to the constriction, and astamose with the anterior branches of the intercostal arteries. An efficient collateral circulation develops. The tortuous intercostal arteries produce a peculiar notching of the lower borders of the ribs which often can be seen on x-ray films of the chest. In this case these x-ray findings in the ribs were minimal and were considered to be within normal limits.

DR. PEPPARD: I think that one should palpate the femoral arteries when examining patients with heart disease. If that had been done, one probably would have noticed diminished femoral pulsation. That would have been a clue to the recognition of coarctation of the aorta. Then further, examination probably would have shown reduced blood pressure in the legs as compared to the arms, and possibly pulsating intercostal arteries.

INTERN: Is it unusual to live as long as he did with coarctation of the aorta?

DR. PEPPARD: No. Some cases live even longer. However, many die in infancy and about 50 per cent die during early adult life.

DR. LOFSNESS: The pathogenesis of coarctation of the aorta appears to be related in some way to closure of the ductus arteriosus. The root of the aorta usually dilates proximal to the constriction; often an aneurism forms and quite a few die from rupture of this aneurism. Many of them die of congestive heart failure. Some of the older patients die of cerebral hemorrhage because of the hypertension. The primary cause of death in this case was lobar pneumonia. The old rheumatic valve defects, the adherent pericardium and the coarctation of the aorta apparently played only a minor role in his death as there was no evidence of heart failure. The bacterial endocarditis appears to have been a terminal process.

Anatomical Diagnosis: (1) Lobar pneumonia; (2) old valve defects (aortic and mitral); (3) acute bacterial endocarditis (mitral); (4) adherent pericardium; (5) coarctation of the aorta.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

THE PLANNING BOARD REPORT

Congressional reaction toward the report of he National Resources Planning Board is said have been lukewarm. While editors have een exploring America's five-pound (by weight) lue print for postwar living, Congressional com- ittees have continued to refuse appropriations or perpetuation of the board which created it.

Many bills for extension of the present Social ecurity Act into new fields have been referred o committees, but few, so far, have come out f them with recommendations for passage.

Congress for Delay

The prevailing temper of Congress seems to e to delay any further sweeping social legisla- ion until the war is out of the way. The attitude f the President and the planners, on the other and, is that action to prevent terrible economic islocation and wide-scale suffering after the war nust be taken now.

What will eventually happen in America de- ends upon many factors still hidden in the ncertainties ahead.

The general trend all over the world has been o protect common men from the hazards of life nd it is highly improbable, even in the face of ostwar reaction, that America will fail to move considerable distance in that direction.

Some highlights of the Planning Board report levoted to the public social services are quoted elow:

"Public services essential to the health, education nd welfare of the population should be available hroughout the country, especially in areas which are isadvantaged in respect to income and taxable wealth.

"In most communities, marked expansion of present ervices will be required in order to achieve these bjectives. The planning and administration of public ocial services should be lodged in appropriate agencies f government and responsibility for their development hould be shared by local, state and federal authorities.

"For More Adequate Medical Care"

*"It is essential that public provision be made for meeting the needs of our people for more adequate medical care.** Toward this end, the federal government should stimulate, assist or undertake constructive action to provide such care for the millions of our people whose need cannot be fully met from their own resources. Such a program should include adequate provision for promoting the health of mothers and children.

"State and local child-welfare services for the prevention of child neglect and delinquency and for promoting adequate care of children requiring special attention should be expanded with the assistance of the federal government so as to be everywhere available.

"Free school lunches should be provided for all school children.

"The bulk distribution of surplus commodities should be replaced by the stamp plan and greater efforts should be made to prevent the availability of commodities from concealing the inadequacies of general public assistance or from leading to a reversion to payments in kind.

Aid for the Low-income Population

*"Surplus commodities should be available to the entire low-income population, not merely to public-aid recipients."**

The final statement, above, reflects the tenor of the entire document. It is obvious that not merely surplus commodities but essential services are to be made available on some basis, presumably without cost, to "the entire low-income population."

Those who look to the new Congress to hold in check a trend toward great and immediate expansions of Social Security aids must also remember that we are traveling a road down which England has preceded us. The conservative Churchill has lent enthusiastic support to the principles embodied in the Beveridge report and America has never failed, thus far, to follow the leadership of England in domestic and social legislation.

*Italics are ours.

Physicians Must Shape

For physicians, the problem is not, how shall we stop the trend, but, how shall we shape it to protect our own preëminence in education, standards of practice and in personal responsibility? Shaping our own pattern will certainly require more than criticism from the sidelines. It will require close contact with all agencies and organizations on the Washington front and active direction of all policies related to medicine and the public health before they are crystallized into law and regulation.

THE COUNCIL MEETS

Complications involved in the current system of payments to state and county institutions for care of tuberculous patients from so-called unorganized counties were the subject of extensive discussion at the February meeting of the Council.

Sanatorium Costs and Payments

The per diem cost to unorganized counties (in which there are no county-supported institutions) of patients sent to the state institution at Ah-Gwah-Ching is only $1.40 while per diem costs of these patients in neighboring county institutions ranges from $2.50 to $4.50. County officials are therefore reluctant to send patients to the county institutions though they may be much nearer home and even though lack of empty beds at the state sanatorium may entail long and dangerous delays.

Dr. A. T. Laird, superintendent of Nopeming Sanatorium, expressed the hope that the Council would recommend legislation at this session to rectify the situation by increasing state payments for nonresident patients at county institutions. The extra five dollars a week, authorized by the last legislature in an attempt to equalize matters, was not sufficient, he said.

Dr. E. K. Geer, medical director of Ancker Pavilion, represented the Committee on Tuberculosis in the discussion. He acknowledged the need for some equalizing legislation but submitted the opinion of his committee that the whole matter of costs and payment needs extensive study by competent state agencies before legislation is recommended. He suggested also that the problem of incorrigible patients, subject of another action by the Committee on Tuberculosis, be included in the study looking toward eventual recommendations for forcible detention in institutions.

The Council agreed and passed a resoluti recommending that a study of both problems l made by the State Board of Health and tl Division of Social Welfare, in preparation f the introduction of sound legislation on the ma ter at the next session of the legislature.

Meantime the Council also approved a su gestion by Dr. E. J. Simons, council memb and Chief of the Medical Unit of the Divisi of Social Welfare, that the division act now make temporary adjustments between state ar county institutions for the tuberculous by rai ing per diem payments required of the unorgar ized counties for patients sent from their cou ties to the state sanatorium.

Committee Dissolved

Résumé of the brief career of the Committ to Study Medical Services which was organize last fall at the request of the Minnesota Sta Conference on Social Work was given to tl Council by Dr. George Earl of Saint Paul.

This committee, designed at its inception a a conference committee, was expanded to inclu equal representation from all of the organiz tions engaged in medicine and public healt work as a result of action inspired by physician hospital executives, public health officials ar dentists of the state, all of whom rightly co sidered that their associations might have som thing substantial to offer such a study.

At its first meeting, this representative grou found itself baffled by the magnitude of the ta and a total lack of funds. At the second meetir the field of study was narrowed to include on medical services in the state for the indige and each organization was requested to pr vide any available studies or summaries on th subject for consideration of the committee. Th Minnesota State Medical Association, through i representatives, Dr. Earl, Dr. W. A. Coventry Duluth and Dr. A. W. Adson of Rochester, du presented a careful summary of the evolutic of medical services for the indigent in Minn sota, noting its weak points and making recon mendations for improvement. No other organ zation presented any data whatever and at tl third and final meeting of the committee th majority of the members came to the concl sion that it was medical services to low-incom groups which should really engage their atte tion, after all—not medical services to the i

ent. But any useful survey of the actual ent of medical services for low-income groups uld require funds. So they dissolved by mu- l agreement until such time as their respec- organizations—or somebody else—should ply them with funds.

The history of this effort might well serve as varning to other equally casual attempts to ve complicated social problems. As a matter fact, surveys of medical care have taxed the st experienced and intrepid investigators even ere they have been equipped with unlimited ids. It may be that any extra funds which ght in the future be found by the participating anizations could be put to better use.

afness Bill Approved

A bill to provide a statewide program for ction, medical correction and educational ad- tment of children with impaired hearing was sented by Dr. Horace Newhart, of Minne- lis, chairman of the Committee on Deafness evention. The Council approved it in prin- le and referred it for further action to the mmittee on Public Policy.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. DuBois, M.D., Secretary

Ex-convict and Quack Returned to Minneapolis Workhouse to Serve Balance of Sentence

: State of Minnesota vs. Frank J. Brady, alias Frank Bateman

On March 23, 1943, the Honorable Frank E. Reed, lge of the District Court of Hennepin County, made order revoking a stay of sentence previously grant- Frank J. Brady, fifty-seven years of age, and order- Brady taken to the Minneapolis Workhouse to ve ten months remaining on a sentence imposed y 7, 1941.

Brady was released from the Minneapolis Work- use September 20, 1941, after serving 2½ months of one-year sentence for practicing healing without a ic science certificate. Brady was released so that could obtain employment with the Dakota Union rminal at Fargo, North Dakota. Brady was also uired to remain out of the State of Minnesota for eriod of five years. This condition was violated by ady when he returned to the City of Minneapolis l his presence was reported to the Minnesota State ard of Medical Examiners on March 20, 1943. rough the coöperation of Mr. Michael J. Dillon, unty Attorney of Hennepin County, the Minneapolis lice Department and Sheriff Earle Brown, Brady s immediately arrested and lodged in the Hennepin unty Jail. Three days later he was ordered returned the Minneapolis Workhouse by Judge Reed and ll now have to serve his entire sentence.

Brady has a long criminal record dating back to 1922 when he pleaded guilty in the District Court of Ramsey County to an information charging him with grand larceny in the second degree. In October, 1931, he pleaded guilty in the District Court of Hennepin County to the crime of manslaughter in the first degree, following the death of a woman from a criminal abortion. Brady served thirty-one months for the first offense and six years for the second offense. Brady's ex-wife, Isabelle Bateman, also served three years in the Women's Reformatory at Shakopee for criminal abortion.

Minneapolis Drug Addict Sentenced to Five-Year Term in the Women's Reformatory at Shakopee

Re: State of Minnesota vs. Madelyn Houchins Tremont, alias Mrs. Charles Rayburn, alias Peggy Lane, alias Marguerite Moore, alias Rose Fields, alias Madelion Field, alias Madelyn Frances.

On March 22, 1943, Madelyn Houchins Tremont, thirty-four years of age, was sentenced by the Honorable Arthur W. Selover, Judge of the District Court of Hennepin County, to a term of not to exceed five years in the Women's Reformatory at Shakopee. The defendant had pleaded guilty on February 9, 1943, to an information charging her with obtaining narcotic drugs by fraud, deceit and subterfuge. The defendant at the time of her arrest resided at 610 Adams Street, N.E., Minneapolis.

This defendant has a long criminal record of shoplifting and numerous other offenses. She admitted having been addicted to the use of narcotic drugs for the past nine years. There is evidence, however, that she has used narcotic drugs for the past sixteen years. The defendant was first arrested in 1926 at Louisville, Kentucky. Since that time she has been arrested in Michigan, Ohio, and in 1939, the defendant was arrested at Fergus Falls, Minnesota, charged with grand larceny in the second degree, growing out of the alleged theft by this defendant of a fur coat from one of the Fergus Falls stores, The coat was subsequently paid for and the defendant fined $50 and costs for petit larceny. In April, 1940, the defendant was arrested on a similar charge at St. Cloud. She paid for the coat and also made good a worthless check. On July 6, 1942, the defendant was found guilty of violating the Minneapolis City Drug Ordinance and sentenced to thirty days in the Workhouse.

The Minnesota State Board of Medical Examiners wishes to commend Judge Selover for refusing to place the defendant on probation, notwithstanding her claim of being pregnant. The defendant's record indicates, conclusively, that she will not free herself of drug addiction by any voluntary methods. It is also appalling that this defendant was able to obtain narcotic prescriptions from at least one member of the medical profession in Minneapolis with practically no difficulty whatsoever. Had the slightest effort been made by this physician the true identity of the defendant could have been ascertained at once through the Minneapolis office of the Federal Bureau of Narcotics.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Physicians Licensed February 13, 1943

January Examination

ALTMAN, Richard Fortune, U. of Nebraska, M.D. 1942, St. Joseph's Hospital, Saint Paul, Minn.

ARNESEN, John Francis, U. of Minn., M.B. 1942, Ancker Hospital, Saint Paul, Minn.

BLACK, William August, Temple University, M.D., 1940, Mayo Clinic, Rochester, Minn.

CHESLER, Merrill David, U. of Minn., M.B. 1942, Ancker Hospital, Saint Paul, Minn.

ELLINGSON, Eugene Andrew, U. of Texas, M.D. 1940, Mayo Clinic, Rochester, Minn.

FLICKINGER, Frederick Miles, Ohio State, M.D. 1941, Mayo Clinic, Rochester, Minn.

GILBERTSON, Eva Labelle, Temple University, M.D., 1941, Mayo Clinic, Rochester, Minn.

GODWARD, Alfred Charles, U. of Minn., M.B. 1942, 5104 Colfax Ave. S., Minneapolis, Minn.

GREEN, Walter Stanley, U. of Southern California, M.D. 1942. Mayo Clinic, Rochester, Minn.

HAGAN, Edward Jordan, Rush, M.D. 1942, Ancker Hospital, St. Paul, Minn.

HANLON, George Henry, Jefferson, M.D. 1941, Mayo Clinic, Rochester, Minn.

HARTWICH, Roger Frank, U. of Minn., M.B. 1942, Milwaukee Co. Hosp., Wauwatosa, Wis.

HEIM, Delmer John, Wayne, M.D. 1942, 2644 Fremont Ave., Minneapolis, Minn.

Cook County
Graduate School of Medicine

(In Affiliation with Cook County Hospital)

Incorporated not for profit

ANNOUNCES CONTINUOUS COURSES

SURGERY—Two Weeks' Intensive Course in Surgical Technique starting April 19, May 3, 17, and 31, and every two weeks throughout the year.

MEDICINE—Two Weeks' Intensive Course starting June 7. One-Month Course in Electrocardiography and Heart Disease starting the first of every month, except August.

FRACTURES AND TRAUMATIC SURGERY—Two Weeks' Intensive Course starting June 14.

GYNECOLOGY—Two Weeks' Intensive Course starting June 28th; Clinical and Diagnostic Courses.

OBSTETRICS—Two Weeks' Intensive Course starting April 19.

OPHTHALMOLOGY—Two Weeks' Intensive Course starting September 13. Course in Refraction Methods starting May 3.

OTOLARYNGOLOGY—Two Weeks' Intensive Course starting September 27.

ROENTGENOLOGY—Courses in X-ray Interpretation, Fluoroscopy, Deep X-ray Therapy every week.

UROLOGY—Two Weeks' Course and One-Month Course available every two weeks.

CYSTOSCOPY—Ten-Day Practical Course every two weeks.

General, Intensive and Special Courses in All Branches of Medicine, Surgery and the Specialties.

TEACHING FACULTY — ATTENDING STAFF OF COOK COUNTY HOSPITAL

Address: Registrar, 427 S. Honore St., Chicago, Ill.

HENDERSON, Lowell Lawrence, Indiana U., M.D. 1941 Mayo Clinic, Rochester, Minn.

HINZ, Walter Ernest, Northwestern, M.B. 1942, Ancke Hospital, Saint Paul, Minn.

HOYER, Louis Paul, Jr., U. of Pa., M.D. 1940, Mayo Clinic, Rochester, Minn.

KABAT, Herman, U. of Minn., M.D. 1942, 1512 7th St S. E., Minneapolis, Minn.

LEIBOLD, Edwin Francis, Marquette, M.D. 1942, St Mary's Hospital, Duluth, Minn.

LEITSCHUH, Thomas Henry, U. of Minn., M.B. 1942 St. Mary's Hospital, Duluth, Minn.

LEWIS, Richard Edwin, U. of Minn., M.B. 1942, Ancke Hosp., Saint Paul, Minn.

LONG, Russell C., U. of Cincinnati, M.D. 1941, Mayo Clinic, Rochester, Minn.

McKIBBIN, John Philip, Northwestern, M.D. 1941, Mayo Clinic, Rochester, Minn.

MALBIN, Morris, Rush, M.D. 1938, U. Hosp. Cancer In stitute, Minneapolis, Minn.

MELTON, Thomas June, Jr., Tulane, M.D. 1940, Mayo Clinic, Rochester, Minn.

MENOLD, William Fredrick, U. of Minn., M.B. 1942 St. Joseph's Hospital, Saint Paul, Minn.

MILLER, Sidney, Johns Hopkins, M.D. 1940, Mayo Clinic Rochester, Minn.

MONAHAN, Robert Hugh, Jr., U. of Minn., M.B. 1942 Miller Hospital, Saint Paul, Minn.

MORTON, Paul Vanderhoff, McGill, M.D. 1940, Mayo Clinic, Rochester, Minn.

NESSET, Lawren Blane, U. of Minn., M.B. 1942, Gen eral Hospital, Minneapolis, Minn.

PETERSON, Carl Andrew, U. of Minn., M.B. 1942, Ancke Hospital, Saint Paul, Minn.

PHARES, Otto Carmony, U. of Minn., M.B. 1942, Gen eral Hospital, Minneapolis, Minn.

REGAN, Joseph Michael, Marquette, M.D. 1941, Mayo Clinic, Rochester, Minn.

REMINGTON, John Paul, U. of Minn., M.B. 1942, Ancke Hospital, Saint Paul, Minn.

ROSSBERG, Raymond Arnold, U. of Minn., M.B. 1942 Ancker Hospital, Saint Paul, Minn.

ROWLAND, Willard Daniel, Washington Univ., M.D 1940, Mayo Clinic, Rochester, Minn.

RUCH, Donald Merrill, U. of Rochester, M.D. 1941 Mayo Clinic, Rochester, Minn.

SHERIDAN, Richard Brinsley, Yale, M.D. 1941, Mayo Clinic, Rochester, Minn.

SMITH, Scott Meadows, U. of Louisville, M.D. 1939 University Hospital, Minneapolis, Minn.

By Reciprocity

WATKINS, David Hyder, U. of Colorado, M.D. 1940 Mayo Clinic, Rochester, Minn.

CLARKSON, William Rycroft, Hahnemann, Pa., M.D 1940, Mayo Clinic, Rochester, Minn.

O'CONNOR, William Benedict, St. Louis Univ., M.D 1942, 1163 Hague Ave., St. Paul, Minn.

TOSSELAND, Noel Everett, St. Louis Univ., M.D. 1942 St. Mary's Hospital, Duluth, Minn.

National Board of Medical Examiners

SENGPIEL, Gene William, Marquette, M.D. 1941, Mayo Clinic, Rochester, Minn.

THOMAS, John Fulton, U. of Pa., M.D. 1940, Mayo Clinic, Rochester, Minn.

TICE, George Irving, U. of Iowa, M.D. 1240, Mayo Clinic, Rochester, Minn.

PYOKTANIN SURGICAL GUT

Plain and Formalized

Manufactured Since 1899 by

The Laboratory of the Ramsey County Medical Society

Packaged dry in hermetically sealed glass tubes in accordance with the new requirements of the U. S. Pharmacopoeia.

• • •

Price List

PLAIN TYPE A NONBOILABLE
AND
FORMALIZED TYPE C NONBOILABLE

Sizes.....000 — 00 — 0 — 1 — 2 — 3
28 inches.....per dozen strands $2.00
60 inches.....per dozen strands $3.00

Special discount to hospitals and to the trade. Cash must accompany the order.

• • •

Address

LABORATORY RAMSEY COUNTY MEDICAL SOCIETY

Lowry Medical Arts Building, St. Paul, Minnesota

FOR SALE BY SURGICAL DEALERS AND DRUGGISTS

In Memoriam

WILLIAM BLACK

Dr. William Black, for the past twenty-six years a practitioner at Mankato and prominent in club and fraternal organizations in that city, died February 13, 1943, at the age of sixty-five.

Dr. Black was born at Rossville, Indiana, January 13, 1878, and graduated from the Frankfort, Indiana, High School in 1898. He received his B.A. degree from Wabash College at Crawford, Indiana, in 1903 and his medical degree from the University of Minnesota in 1909.

After practicing at Parkers Prairie, Minnesota, for a year and at Tyndale, South Dakota, from 1910 to 1915 and at Gaylord, Minnesota, for two years he moved to Mankato in 1917 where he has since practiced.

Dr. Black was prominent in the Masonic Lodge, was a patron of the Eastern Star, a member of the Kiwanis Club and the Elks Lodge. He was also a member of the Blue Earth County Medical Society, the Minnesota State Medical Association and the American Medical Association. At one time he was chief of staff of the Immanuel Hospital of Mankato.

In 1910 Dr. Black married Lillian Bausman of Minneapolis. Following her death in 1938 he married Evelyn Sumner Schrupp who survives him. Also surviving are two daughters, Lt. Mary Black of the WAAC and Mrs. Dorothy LaBrie of Minneapolis and four grandchildren.

OTONIEL FLORES

Dr. Otoniel Flores of Dodge Center, Minnesota, died at Rochester, March 5, 1943, at the age of fifty-five.

Dr. Flores was born at Heridia, Costa Rica, August 24, 1887. He received his early education in Costa Rica and obtained a B.A. degree from the Liceo De Heridia in 1912. He attended the University of Pennsylvania Medical School from 1914 until 1917 and obtained his medical degree from the University of Loyola, Chicago, in 1918.

Dr. Flores spent six months in practice with Dr. C. T. Granger at Rochester and a year at Claremont, Minnesota, before establishing his practice at Dodge Center in 1921. In 1926 he became a naturalized citizen of the United States. From 1926 to 1933 he was Dodge County physician and from 1930 to 1932 was mayor of Dodge Center. He was also a member of the staff of the Owatonna Hospital, the Steele County Medical Society, the Minnesota State and American Medical Associations. He was a member of the Catholic Church and held membership in the Commercial Club of Dodge Center. His hobby consisted of wood working.

Dr. Flores married Minerva Benson, February 25, 1921, in Joliet, Illinois. He is survived by his widow and two daughters, Graciela M. and Virginia M. Flores, and a brother, Dr. M. A. Flores of Rosemount, Minnesota.

FRANCIS GUSTAVE LAGERSTROM

Dr. Francis Gustave Lagerstrom, Minneapolis, died March 13, 1943, at the age of sixty-seven.

Dr. Lagerstrom was born in Sweden in 1875, but came to this country fifty years ago. He received his medical education at the Kansas Medical College, Topeka, Kansas, completing the course in 1899.

After practicing at Lindstrom, Minnesota, for nine years, he moved to Minneapolis where he practiced until his retirement several years ago.

GUSTAV H. LUEDTKE

Dr. Gustav H. Luedtke of Fairmont died at his home March 18, 1943.

Dr. Luedtke was born November 18, 1870, in Blue Earth County, Minnesota. He received his early education at Mankato and his medical education at the University of Minnesota, graduating in 1899.

He served in the Medical Corps of the United States Army for twenty months during World War I and was a member of the Blue Earth Valley Medical Society and the Minnesota State and American Medical Associations.

CHARLES W. SIMISON

Dr. Charles W. Simison, a resident of Hawley, Minnesota, for the past thirty-five years, died March 6, 1943, in a Moorhead hospital following an illness of two years.

Dr. Simison was born in Mercer, Pennsylvania, April 3, 1878. After engaging in milling in Clinton, Missouri, for a number of years he attended the University of Missouri where he received his medical degree in 1907.

Dr. Simison practiced in Frazee, Minnesota, for a year before moving to Hawley in 1909. He served at one time on the Hawley Water and Light Commission and was a member of the sanitarium commission in Clay and Becker Counties. He was a member of the Clay-Becker County Medical Society and of the Minnesota State and American Medical Associations. He was also a member of the Methodist Church.

Surviving him are Mrs. Simison and three sons, Dr. Carl Simison of Barnesville, Dr. E. Victor Simison of Pocatello, Idaho, and Parker C. Simison, a pharmacist, of Warren, Michigan.

Zemmer

PRESCRIBE or DISPENSE ZEMMER PHARMACEUTICALS

Tablets, Lozenges, Ampoules, Capsules, Ointments, etc. Guaranteed reliable potency. Our products are laboratory controlled. Write for catalogue.

Chemists to the Medical Profession

THE ZEMMER COMPANY, Oakland Station, Pittsburgh, Pa.

MIN 4-43

Reports and Announcements

WAR CONFERENCE

The medical, surgical and industrial hygiene experts who are so ably safeguarding the well-being of more than 20 million industrial workers have agreed to pool their knowledge and exchange their experiences regarding the many new and complex problems of today's wartime production. For this purpose their organizations—the American Association of Industrial Physicians and Surgeons, the American Industrial Hygiene Association, and the National Conference of Governmental Hygienists—are combining their annual meetings in a four-day "War Conference" at Rochester, New York, May 24-27, 1943. Among the problems to be discussed from a practical standpoint are:

The mass entry of women into industry;

Older-age employes, with their various associated problems; proper placement and employability considerations of the 4F rejectees;

Rehabilitation and proper employment of those already discharged from the military services because of disabling conditions;

Toxic and other hazards from new substances, new processes, and the use of substitute materials;

Absenteeism; fatigue; nutrition;

Effects of long hours; double shifts; two-job workers; overtime; increased industrial accident rates;

Advances in the treatment of illnesses and injuries, and many others.

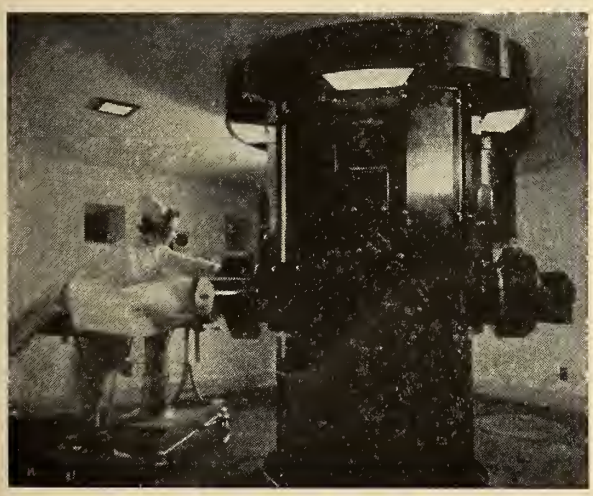
This joint meeting will be a report on the state of the nation, by the men who know, in matters of industrial health. Dr. William A. Sawyer, Medical Director of Eastman Kodak, is General Chairman; Dr. James H. Sterner and Lieut. Comm. J. J. Bloomfield are arranging the programs for the industrial hygienists.

Physicians and surgeons, hygienists, engineers, nurses, executives—all who are interested in the probems of industrial health and their solution—are invited to attend as many of the sessions as they can arrange for; no registration fee is required.

MINNESOTA SOCIETY OF NEUROLOGY AND PSYCHIATRY

The regular meeting of the Minnesota Society of Neurology and Psychiatry was held at the Town and Country Club, Saint Paul, Tuesday, March 9, 1943. The dinner meeting was addressed by Dr. Miland E. Knapp on the subject, "The Physiological and Pathological Basis of the Kenny Concept of Poliomyelitis." Dr. Alfred W. Adson is president of the Society and Dr. Royal C. Gray, secretary-treasurer.

Radiation Therapy Institute



Treatment Room

of Saint Paul

CHARLES T. MILLER HOSPITAL

Facilities for Radium and Roentgen Therapy, Including Million Volt Constant Potential Installation of Most Advanced Design.

You are cordially invited to visit the Radiation Therapy Institute and inspect its facilities

Edward Schons, M.D., *Director* J. P. Medelman, M.D., *Associate Director*

86c out of each $1.00 gross income used for members benefit

PHYSICIANS CASUALTY ASSOCIATION
PHYSICIANS HEALTH ASSOCIATION

Hospital, Accident, Sickness
INSURANCE

For ethical practitioners exclusively
(57,000 Policies in Force)

LIBERAL HOSPITAL EXPENSE COVERAGE	For $10.00 per year
$5,000.00 ACCIDENTAL DEATH $25.00 weekly indemnity, accident and sickness	For $32.00 per year
$10,000.00 ACCIDENTAL DEATH $50.00 weekly indemnity, accident and sickness	For $64.00 per year
$15,000.00 ACCIDENTAL DEATH $75.00 weekly indemnity, accident and sickness	For $96.00 per year

41 years under the same management
$2,418,000.00 INVESTED ASSETS
$11,350,000.00 PAID FOR CLAIMS
$200,000 deposited with State of Nebraska for protection of our members.
Disability need not be incurred in line of duty—benefits from the beginning day of disability.
Send for applications, Doctor, to
400 First National Bank Building Omaha, Nebraska

SURGEONS' TAPE REMOVER

• EASY TO APPLY •

• INEXPENSIVE TO USE •

Include a Bottle with your Next Order.

Per Pint 60c

BROWN & DAY, INC.
St. Paul, Minnesota

WASHINGTON COUNTY SOCIETY

The regular meeting of the Washington County Medical Society was held on March 9 at Stillwater.

After the regular business had been transacted, and a report given of the County Officers' Meeting in Saint Paul, Dr. Edward Schons of Saint Paul gave a talk on "X-ray Treatments." He presented this highly scientific subject in a thorough and interesting manner.

MINNESOTA ACADEMY OF MEDICINE

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, January 13, 1943. Dinner was served at 7 p.m. and the meeting was called to order at 8:10 p.m. by the President, Dr. Harry Zimmerman.

Forty-eight members and two guests were present.

There was no new or old business to come before the Society, and the reading of the minutes of the December meeting was dispensed with.

Dr. Martin Nordland, Minneapolis, then gave his address as Retiring President, which consisted of a lantern slide talk on "Unusual Lesions of the Neck."

E. V. Kenefick, M.D., Secretary.

INVALID DIETS AND FOOD RATIONING

Of interest to all who are concerned with diets for invalids is Ration Order 13, issued by the Office of Price Administration under the date of February 9 1943. This order covers all canned, dried, and frozen fruits and vegetables.

Article II, Section 2.5 of the order reads as follows:

"Consumers who need more processed foods because of illness may apply for more points.

(a) Any consumer whose health requires that he have more processed foods than he can get with War Ration Book Two, may apply for additional points. The application must be made, on OPA Form R-315, by the consumer himself or by someone acting for him, and may be made in person or by mail. The application can be made only to the board for the place where the consumer lives. He must submit with his application a written statement of a licensed or registered physician or surgeon, showing why he must have more processed foods, the amounts and types he needs during the next two months, and why he cannot use unrationed foods instead.

(b) If the board finds that his health depends upon his getting more processed foods, and that he cannot use or cannot get unrationed foods, it shall issue to him one or more certificates for the number of points necessary to get the additional processed foods he needs during the next two months."

The application form referred to above, OPA Form R-315, is apt to be somewhat confusing to patients. It is titled "Sugar Special Purpose Application" and was developed primarily to meet the need for home canning. It is being used temporarily, until a more adequate form can be gotten out.

It is anticipated that the procedure indicated in Section 2.5 above may be changed somewhat in the future, in which case due notice will be provided.

WOMAN'S AUXILIARY

Mrs. Raymond J. Josewski, *President*
Stillwater, Minnesota
Mrs. W. H. Rucker, *Publicity Chairman*
Minneapolis, Minnesota

State Board

The Woman's Auxiliary of the Minnesota State Medical Association held its midwinter board meeting, February 26, in Saint Paul, at the Women's City Club.

The inspiring reports of the county presidents showed the various interests of the doctors' wives in these war days. Aside from surgical dressing groups, nutrition, home nursing and first aid classes, the county groups are sponsoring speakers' bureaus as part of their public relations plans.

Two new and very worthy projects this year are the collections for the medical and surgical Relief Society and the staffing of booths selling war stamps and bonds.

Mrs. E. C. Eshelby of Saint Paul was appointed to represent the State Medical Auxiliary on the Civilian Defense Board.

A nominating committee was elected with Mrs. H. Klein of Duluth, chairman.

St. Louis County

The regular monthly luncheon meeting of St. Louis County Medical Auxiliary was held March 9 at the home of Mrs. A. G. Spang of Duluth. The speaker was Dr. C. A. Shere, County Health Officer, who gave a survey of health conditions in St. Louis County. Mrs. Richard Bardon, one of the auxiliary members, then spoke on the American Red Cross.

Park Region

The Park Region Auxiliary voted to pay dues for the six members whose husbands are in the armed forces. Mrs. Lewis, president, attended the midwinter State Board Meeting in Saint Paul.

A large number of auxiliary members attended the lecture given by Dr. William A. O'Brien at a banquet meeting at the River Inn in Fergus Falls on March 1.

Hennepin County

The March meeting of the Hennepin County Auxiliary was devoted to discussion of gardens for victory led by Dr. Currence from the University Farm Campus.

Mrs. J. M. Hall, vice president of Hennepin County Auxiliary, is completing the year's work for Mrs. James A. Johnson who has been ill.

The membership is looking forward to entertaining the State Auxiliary in May in Minneapolis.

Upper Mississippi

Mrs. C. E. Carlson of Aitkin was elected president of the Upper Mississippi Women's Auxiliary at a meeting held in February. Mrs. J. J. Radcliff of Aitkin was chosen president-elect; Mrs. T. Eyres of Pequot Lakes, vice president; Mrs. Glen Leenhuis of Aitkin, secretary, and Mrs. W. E. Fitzsimons of Brainerd, reëlected treasurer.

WAR WORKERS

put back on jobs quickly when you prescribe a SPENCER SUPPORT



Spencer Sacroiliac Support designed for this woman.

as aid to treatment of

HERNIA

FATIGUE
Due to Overwork

ENTEROPTOSIS
With Symptoms

LOW VITALITY

BACK INJURY

POSTOPERATIVE
Convalescence

WRONG POSTURE
and Symptoms

Since each Spencer Support is individually designed of non-stretchable material to meet the specific needs of the patient, it can be—and IS—*guaranteed* never to lose its shape. Why prescribe a support that soon stretches out of shape and becomes useless?

Spencers are light, comfortable, easily laundered. Every Spencer is designed to improve posture and provide the required degree of abdominal and back support.

Spencer Supports are never sold in stores. For a Spencer Specialist, look in telephone book under "Spencer Corsetiere" or write direct to us.



Spencer Sacroiliac Support designed for this man.

SPENCER *INDIVIDUALLY DESIGNED*

Abdominal, Back and Breast Supports

SPENCER INCORPORATED,
137 Derby Ave., New Haven, Conn.
In Canada: Rock Island, Quebec.
In England: Spencer (Banbury) Ltd., Banbury, Oxon.

May We Send You Booklet?

Please send me booklet, "How Spencer Supports Aid the Doctor's Treatment."

.....M. D.

Of General Interest

Lieutenant Wilford F. Widen of Minneapolis has been assigned to the U. S. Naval Hospital at San Diego, California.

* * *

Dr. and Mrs. Harry C. Jensen of Minneapolis are spending the midwinter months on vacation in Miami, Florida.

* * *

Dr. T. J. Bloedel closed his offices in Gaylord, March 1, to become associated in practice with Dr. A. Neumeier at Glencoe.

* * *

Dr. R. T. Edwards, who has practiced medicine at Elysian since 1914, left in March for Bigfork, Montana, where he will make his home with his sister.

* * *

Dr. T. G. Wellman of Lake City is now stationed with the Medical Corps of the Army Air Corps at Miami Beach, Florida. Dr. Wellman has the commission of First Lieutenant.

* * *

Dr. R. L. Schmidtke recently became associated in practice with Dr. F. E. Bureh of Saint Paul and is in charge of the ophthalmology clinic at the Wilder Dispensary, Saint Paul.

Dr. A. A. Giroux, formerly of Moose Lake, ha moved to Grove City, where he will continue the prac tice of medicine.

* * *

Dr. Carl W. Waldron of Minneapolis has been ap pointed editor of *The Journal of Oral Surgery*, a new publication sponsored by the American Dental Associa tion.

* * *

Dr. Laurence H. Cady has been elected chief of staf of St. Andrew's Hospital, Minneapolis. Dr. Ragnar T Soderlind was elected vice president and Dr. Ferdinand A. Zinter, secretary-treasurer.

* * *

Dr. F. C. Gibbons of Comfrey is building a hospita with a capacity of twelve rooms, increasing his office space and allowing six rooms for the accommodation of patients. Construction of the building was begun in March.

* * *

Dr. H. A. Burns, formerly director of the State Sanatorium at Ah-Gwah-Ching, has been placed in charge of tuberculosis problems in all State Institutions. He



is succeeded at Ah-Gwah-Ching by Dr. F. F. Callahan, formerly head of the Pokegama Sanatorium, Pokegama.

* * *

Dr. Gordon R. Kamman of Saint Paul read a paper before the American Orthopsychiatric Association in New York City, February 22, 1943. The title of his paper was "The Rohrschach Method as a Therapeutic Agent."

* * *

Dr. D. L. Jacobs of Willmar has been commissioned a Lieutenant (sg) in the United States Navy Reserve and reported for duty at San Diego, California, April 5. Dr. Jacobs has been associated in practice with his father, Dr. J. C. Jacobs, at Willmar since 1935.

* * *

Lieutenant Lynn M. Hammerstad, flight surgeon attached to the naval aviation cadet selection board, has been ordered to duty in the western Pacific war theater. Lieutenant Hammerstad was on the staff of the Minneapolis General and Swedish Hospitals, Minneapolis, before entering the Navy in 1939.

* * *

Lt. Col. Richard B. Hullsiek, Saint Paul, who has been medical officer for Selective Service for Minnesota, left March 4 for duty in the Seventh Service Command, Omaha. Colonel Hullsiek has been with the National Guard since 1927. He is succeeded in Minnesota by Major Robert Radl.

* * *

Dr. Wm. C. Heiam, the first physician to locate in Cook, Minnesota, recently completed his fifteenth year of practice in this northern Minnesota town. He started his practice in a one-room office, to which more rooms were added later, now forming the present hospital building in Cook.

* * *

With the winning of his "wings" by Major Edwin G. Benjamin, the Hennepin County Medical Society now numbers five flying members, namely—Major Benjamin, Lieutenant Colonel Lawrence Larson, Lieutenant Frederic Wipperman, Lieutenant Commander Edward Colp and Major Reuben Berman.

* * *

Dr. Herman O. McPheeters is the new president of the Minneapolis Surgical Society, succeeding Dr. Richard R. Cranmer. Other officers elected are: Dr. Daniel A. MacDonald, vice president; Dr. Robert F. McGandy, treasurer; Dr. John M. Feeney, secretary, and Dr. Fred A. Olson, recorder.

* * *

The following subjects were presented at the Interdepartmental Seminar of the Medical School held in the Eustis Amphitheatre, University of Minnesota, Wednesday evening, March 24:

"Unusual Association of Familial Hemolytic Jaundice and Subacute Combined Degeneration in Elderly Man"—C. J. Watson, M.D., Department of Medicine.

"Calcium and Phosphorus Balance Studies in a Case of Idiopathic Hypoparathyroidism"—R. G. Sprague, M.D., and M. H. Power, Ph.D., Mayo Foundation.

"Experimental Mammary Cancer in Mice"—John Bittner, Ph.D., Division of Cancer Biology, Medical School.



PROFESSIONAL PROTECTION

SINCE 1899
SPECIALIZED
SERVICE

In addition to our Professional Liability Policy for private practice we issue a special
MILITARY POLICY
to the profession in the Armed Forces at a
REDUCED PREMIUM

THE
MEDICAL PROTECTIVE COMPANY
OF
FORT WAYNE, INDIANA

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

ANNUAL REPRINT of the Reports of the Council on Pharmacy and Chemistry of the American Medical Association for 1941, with the Comments That Have Appeared in the *Journal*. Price $1. Chicago: American Medical Association, 1942.

LAUGH AT THE LAWYER WHO CROSS-EXAMINES YOU! Charles L. Cusumano, LL.B., of the New York Bar. 375 pages. Price, cloth $3.00. New York: Old Faithful Publishing Co., 1942.

NEW AND NONOFFICIAL REMEDIES, 1942, containing descriptions of the articles which stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association on Jan. 1, 1942. Cloth. Price, postpaid, $1.50. Pp. 671—XCVII, Chicago: American Medical Association, 1942.

ESSENTIALS OF PROCTOLOGY. Harry E. Bacon, B.S., M.D., F.A.C.S., F.A.P.S. Professor and Head of Department of Proctology, Temple University Medical School and Hospital; Head of Department of Proctology, St. Mary's Hospital; Consulting Proctologist, Rush Hospital, National Stomach Hospital, Douglass Hospital, Mercy Hospital, and Paul Kimball Hospital, Lakewood, N. J.; Fellow International College of Surgeons. Introduction by Curtice Rosser, B.A., M.D., F.A.C.S., F.A.P.S. Professor of Proctology, Baylor University, Dallas, Texas. 345 pages. Illus. Price $3.50, cloth. Philadelphia: J. B. Lippincott Co., 1943.

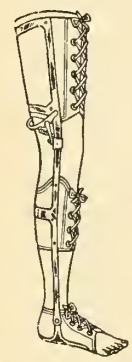
CHEMOTHERAPY OF GONOCOCCIC INFECTIONS. Russell D. Herrold, B.S., M.D. Associate Professor of Surgery (Urology), College of Medicine, University of Illinois, Chicago. 137 pages. Price, cloth, $3.00. Saint Louis: C. V. Mosby Co., 1943.

THE PRINCIPLES AND PRACTICE OF WAR SURGERY. J. Trueta, M.D. Formerly Director of Surgery, General Hospital of Catalonia, University of Barcelona; Assistant Surgeon (E.M.S.), Wingfield-Morris Orthopædic Hospital, Oxford; Acting Surgeon-in-Charge, Accident Service, Radcliffe Infirmary, Oxford. With introduction by Owen Wangensteen, M.D., Minneapolis, Minnesota. 441 pages. Illus. Price, cloth, $6.50. St. Louis: C. V. Mosby Co., 1943.

FUNDAMENTALS OF PSYCHIATRY. Edward A. Strecker, M.D., Sc.D., F.A.C.P. 201 pages. Illus. Price, $3.00. Philadelphia; J. B. Lippincott Co., 1942.

Dr. Strecker has written a concise presentation of the modern concept of psychiatry and its relationship to all fields of medicine. It will be of great practical value to the medical student as well as to all doctors who lack psychiatric training. It is particularly appealing because of its lack of abstract terms and psychiatric patter in general. It is these faults which usually cause the average person to abhor psychiatry, and Dr. Strecker has done a good job in minimizing them.

—W. A. CARLEY, M.D.



Orthopedic Braces and Appliances

Physicians' specifications followed precisely. Scientific manufacture and fitting.

AUGUST F. KROLL

Manufacturer

230 WEST KELLOGG BLVD.

St. Paul, Minn. CE. 5330

Send us your slow collection items.

All accounts made by personal calls.

We specialize in Medical and Dental Accounts.

Bonded and Licensed Under Minnesota State Laws

Northwestern Adjustment Co.

518 Bremer Arcade Bldg.

St. Paul **Minnesota**

DANIELSON MEDICAL ARTS PHARMACY, INC.

PHONES:
ATLANTIC 3317
ATLANTIC 3318

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

HOURS:
WEEK DAYS—8 to 7
SUN. AND HOL.—10 TO 1

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.

414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.

INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS

MAIN 2494



The Birches Sanitarium, Inc.

2391 Woodland Avenue

Duluth, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Psychiatrists in Charge

L. R. Gowan, M.D. **A. S. Nissen, M.D.**



VOCATIONAL HOSPITAL

. . . An integral part of the Miller Vocational High School offers two special features—Patients receive a maximum of personal attention from student practical nurses—All food is prepared under the direction of a qualified dietitian. Patients remain under the care of their own physicians.

Director of Nurses—M. H. WOLTMAN, R.N., B.S.

Superintendent & Dietitian—H. B. BROWN, B.S.

Physicians may secure services of Vocational nurses by calling Nurses Headquarters and asking for a Vocational Nurse

Bridgeport 2281

5511 South Lyndale - - Minneapolis

OVARIAN TUMORS. Samuel H. Geist, M.D. New York: Paul B. Hoeber, Inc., 1942. 527 pages. Illus. Price $10.50.

This is a very important subject presented by a national authority in a 500-page volume of very interesting reading.

In the opening chapter the author presents the embryology, the anatomy and the physiology of the ovary. Then he presents all the well-known as well as the rarer forms of ovarian tumors according to the embryological histologic structure from which they arise; a classification presented by Schroeder. Each tumor is discussed as to its frequency, gross and microscopical pathology, its clinical aspects and therapy.

He has a chapter on ovarian tumors in children, one on ovarian tumors in pregnancy; a chapter on diagnosis and one on treatment.

His chapter on general considerations is very good and complete.

A very lengthy bibliography follows each chapter.

SYNOPSIS OF PATHOLOGY. By W. A. D. Anderson. 661 pages, 294 test illustrations and 17 color plates. Price, $6.00. St. Louis: C. V. Mosby Company, 1942.

This volume is an excellent condensation of the whole field of pathology. It is surprising that the author could cover so much ground in such a compact volume. The linkage of pathology with clinical medicine is stressed throughout the book. The illustrations are excellent. In fact, it is rare to see a photographer with such an esthetic sense in the arrangement of gallstones as in the photograph on page 348.

It seems to this reviewer that the whole subject of pathology could be simplified by classifying the diseases of organs under five headings: first, acute inflammation; second, chronic inflammation; third, benign tumors; fourth, malignant tumors; and fifth, anomalies, mechanical defects, etc. If the various organs were reviewed in this manner, there would be much less repetition and students would have much better concept of the diseases of the various organs. It certainly helps the student to get a better grasp of the differential diagnosis of diseases. The above paragraph is not meant as a criticism of the volume, as the development of the subject is one of individual preference.

This volume is highly recommended for an up-to-date review of pathology.

CHARLES E. REA, M.D.

Uncorrected *visual defects*, that would cause productive deficiency, have been found in one person out of every four applying for work in certain factories.

Castor-bean growing will be greatly increased in 1944, with some 3,000,000 pounds of seed expected to be produced this season from 10,000 acres in eight Midwestern states under a federal government plan.

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.
414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.
INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS
MAIN 2494

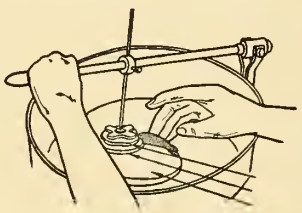
SAVE TIME!
TRY DAHL'S
Biologicals — Dressings
Pharmaceuticals — Surgical Instruments
Hypodermic Medications
Day and Night Service
Joseph E. Dahl Co.
Incorporated
ATlantic 5445 — 82 So. 9th St., Mpls.

Radiological and Clinical
Assistance to Physicians
in this territory
MURPHY LABORATORIES
Minneapolis: 612 Wesley Temple Bldg. - - At. 4786
St. Paul: 348 Hamm Bldg. - - - - - - - Ce. 7125
If no answer, call - - - - - - - - - - Ne. 1291

Social and Educational Adjustment
for exceptional children of all ages. Visit the school noted for its work in educational development and fitting such children for more normal living. Beautiful grounds. Home atmosphere. Separate buildings for boys and girls.
Catalog by request.
The **MARY E. POGUE SCHOOL**
98 GENEVA ROAD — WHEATON, ILL.
(NEAR CHICAGO)

Hall & Anderson
PRESCRIPTION PHARMACY
BIOLOGICALS
PHYSICIANS' SUPPLIES
SAINT PAUL, MINN.
LOWRY MEDICAL ARTS BUILDING
TELEPHONE: CEDAR 2735

CHECKING SERVICE . . .
The American **ECONOMY** *Way*
THE AMERICAN NATIONAL BANK offers a NEW PLAN in Personal Checking Accounts.
This service is offered to those who would like to open a checking account but find it inconvenient to maintain the balance required for regular checking accounts. A charge of 7c is made for each check paid, also a nominal charge on deposits.
Open an account for any amount.
THE AMERICAN NATIONAL BANK
BREMER ARCADE — *Free Parking* — *Member Federal Deposit Insurance Corporation*
7TH AT ROBERT
Cedar 0573

UNUSUAL LENS GRINDING

CATARACT, MYO-THIN and other difficult and complicated lenses are ground to extreme thinness and accuracy by our expert workmen.
ARTHUR F. WILLIAMS
SAINT PAUL
MINNESOTA

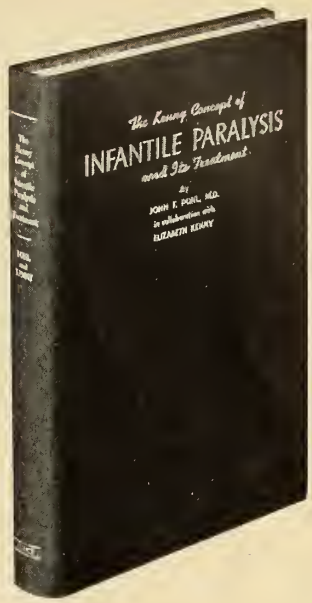
Save 25 to 40 Per Cent — **Druggists' Mutual Insurance Company** OF IOWA, ALGONA, IOWA — *Prompt Loss Service*
Fire - Tornado - Automobile Insurance
Minneapolis Branch—S. E. STRUBLE, 835 Palace Bldg. — Home Office—Algona, Iowa

An old disease takes on new entity:

The Kenny Concept of

INFANTILE PARALYSIS

and its Treatment



By JOHN F. POHL, M.D.
In Collaboration With
SISTER ELIZABETH KENNY
Foreword by
FRANK R. OBER, M.D.

THE CONCEPT: A completely new theory of the symptomatology and effects of INFANTILE PARALYSIS. It is the result of thirty years of keen observation, meticulous study and diligent labor by Sister Kenny. Without doubt it is the most important contribution ever made toward the control of this dread disease.

BASIS OF PROOF: Clinical results over a period of several years, both here and abroad, are direct evidence of the success of Sister Kenny's treatment. Her work has been approved by practically the entire medical profession. The National Foundation for Infantile Paralysis endorses it. Eminent orthopedic surgeons accept and praise it.

THE TREATMENT: Step by step, this new book on INFANTILE PARALYSIS takes the reader through nearly four hundred pages of detailed instructions in Sister Kenny's treatment, with more than one hundred explanatory photographs. While the book is designed for easy reading, it is distinctly a textbook for the medical profession. Every physician should own a copy. In his hands it becomes a weapon of defense on the Home Front.

Size 6 x 9 inches. Cloth Bound.
368 pages. 114 Explanatory Photographs.
PRICE, $5.00 postpaid

BRUCE PUBLISHING COMPANY
Medical Publications
Saint Paul **Minneapolis**



Three of the units

Glenwood Hills Hospitals

3501 Golden Valley Road
Hyland Station
Route Seven

Operated In Connection with Homewood Hospital

Plymouth at Penn Avenue, Minneapolis

FOR THE TREATMENT OF NON-SURGICAL AND NON-INFECTIOUS DISEASES

A modern hospital built on the cottage plan. The buildings are located on elevated land, affording beautiful views on all sides. Glenwood Hills Hospitals have all the advantages of rural surroundings, and are still only a few minutes by automobile from the Minneapolis loop.

AN INVITATION

The facilities of these institutions are available for all reputable members of the medical profession.

✶ CLASSIFIED ADVERTISING ✶

FOR SALE—Nearly new Hamilton steel examining room furniture. Reasonable. Address G. C. Edwards, 1545 East River Terrace, Minneapolis. Telephone: Bridgeport 0913.

BUY WAR BONDS AND STAMPS

WANTED—Position, industrial or group—permanent Age 34, married. Honorable medical discharge serv ice U. S. Army. Licensed Minnesota. Availabl now. Address D-45, care MINNESOTA MEDICINE.

PHYSICIAN WANTED—To take over excellent estab lished general practice of physician entering militar service. Located thirty-five miles from Twin Cities Address D-44, care MINNESOTA MEDICINE.

WAUKESHA SPRINGS SANITARIUM



BUILDING ABSOLUTELY FIREPROOF

FOR THE CARE AND TREATMENT OF

NERVOUS DISEASES

BYRON M. CAPLES, M. D., Medical Director
FLOYD W. APLIN, M. D.

WAUKESHA, WIS.

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 **May, 1943** **No. 5**

Contents

The Procurement and Assignment Service for Physicians, Dentists and Veterinarians.
Harold S. Diehl, M.D., Minneapolis, Minnesota.. 419

Collapse Therapy in Treatment of Pulmonary Tuberculosis.
G. A. Hedberg, M.D., Nopeming, Minnesota..... 428

Chest Conditions Simulating Tuberculosis.
E. R. Crow, M.D., Ah-Gwah-Ching, Minnesota... 430

Naturally Acquired Tuberculosis in Heterologic Hosts.
William H. Feldman, D.V.M., M.S., Rochester, Minnesota 437

Diagnosis of Early Tuberculosis Among University Students.
Ruth E. Boynton, M.D., Minneapolis, Minnesota 439

How a County Can Be Accredited for Tuberculosis Control.
S. A. Slater, M.D., Worthington, Minnesota..... 443

Clinical-Pathological Conference.
Presentation of a Case.
A. J. Hertzog, M.D., and *S. V. Lofsness, M.D.,* Minneapolis, Minnesota 445

History of Medicine in Minnesota.
History of Medicine in Dodge County.
James Eckman, Rochester, and *Charles E. Bigelow, M.D.,* Dodge Center, Minnesota..... 447

President's Letter 453

Editorial:

State Meeting 454

Propamidine 454

Spanish and Portuguese in Medical Schools..... 455

Medical Economics:

New Pattern in Medical Service..... 457

Stumbling Block 458

Minnesota State Board of Medical Examiners.... 458

In Memoriam 459

Minnesota State Medical Association:
Roster, 1943 461

Minnesota State Medical Association:
Ninetieth Annual Session..... 488

Woman's Auxiliary 490

Minnesota Academy of Medicine:

Meeting of February 10, 1943..... 491

Transient Infiltration of the Lung Parenchyma Associated with Eosinophilia. (Discussion only)
Everett K. Geer, M.D., Saint Paul, Minnesota.. 491

Injury to Spinal Cord and Meninges from Spinal Anesthetic. (Abstract and Discussion)
Gordon R. Kamman, M.D., Saint Paul, Minnesota 491

Reports and Announcements..... 494

Of General Interest..... 495

Book Reviews 497

Contents of Minnesota Medicine copyrighted by Minnesota State Medical Association, 1943

Entered at the Post Office in Minneapolis as second class mail matter. Accepted for mailing at the special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 13, 1918.

MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL ASSOCIATION

Published by the Association under the direction of its Editing and Publishing Committee

EDITING AND PUBLISHING COMMITTEE

E. M. HAMMES, Saint Paul
PHILIP F. DONOHUE, Saint Paul
H. W. MEYERDING, Rochester
H. A. ROUST, Montevideo
B. O. MORK, JR., Worthington
A. H. WELLS, Duluth
O. W. ROWE, Duluth
T. A. PEPPARD, Minneapolis
HENRY L. ULRICH, Minneapolis
C. L. OPPEGAARD, Crookston

EDITORIAL STAFF

CARL B. DRAKE, Saint Paul, Editor
GEORGE EARL, Saint Paul, Associate Editor
HENRY L. ULRICH, Minneapolis, Associate Editor

BUSINESS MANAGER

J. R. BRUCE

Annual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian Subscriptions—$3.50.

The right is reserved to reject material submitted for editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

Classified advertising—five cents a word; minimum charge, $1.00. Remittance should accompany order.

Display advertising rates on request.

Address all communications to Minnesota Medicine, 2642 University Avenue, Saint Paul, or National Bldg., Minneapolis. Telephone Nestor 2641.

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN



MAIN BUILDING—ONE OF THE 5 UNITS IN "COTTAGE PLAN"

A Modern Private Sanitarium for the Diagnosis, Care and Treatment of Nervous, Mental and Medical Cases

Located on beautiful Lake St. Croix, eighteen miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Milk, cream and butter from our own herd of Tuberculin-tested Registered Guernsey Cows. Inspection and coöperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

CONSULTING NEURO-PSYCHIATRISTS

Hewitt B. Hannah, M.D.
Joel C. Hultkrans, M.D.
511 Medical Arts Building
Minneapolis, Minnesota
Tel. MAin 4672

RESIDENT PHYSICIAN
Howard J. Laney, M.D.
Prescott, Wisconsin
Tel. 39

SUPERINTENDENT
Ella M. Mackie
Prescott, Wisconsin
Tel. 69



Nervous excitation

rarely follows even long-repeated applications of this fast, sustained-action vasoconstrictor

Neo-Synephrine Hydrochloride

(laevo—alpha—hydroxy—beta—methyl—amino—3 hydroxy ethylbenzene hydrochloride)



ACCEPTED AMERICAN MEDICAL ASSN Council on Pharmacy and Chemistry

Available in a ¼% or 1% solution in 1-oz. bottles for dropper or spray; and as a ½% jelly in collapsible tube with applicator.

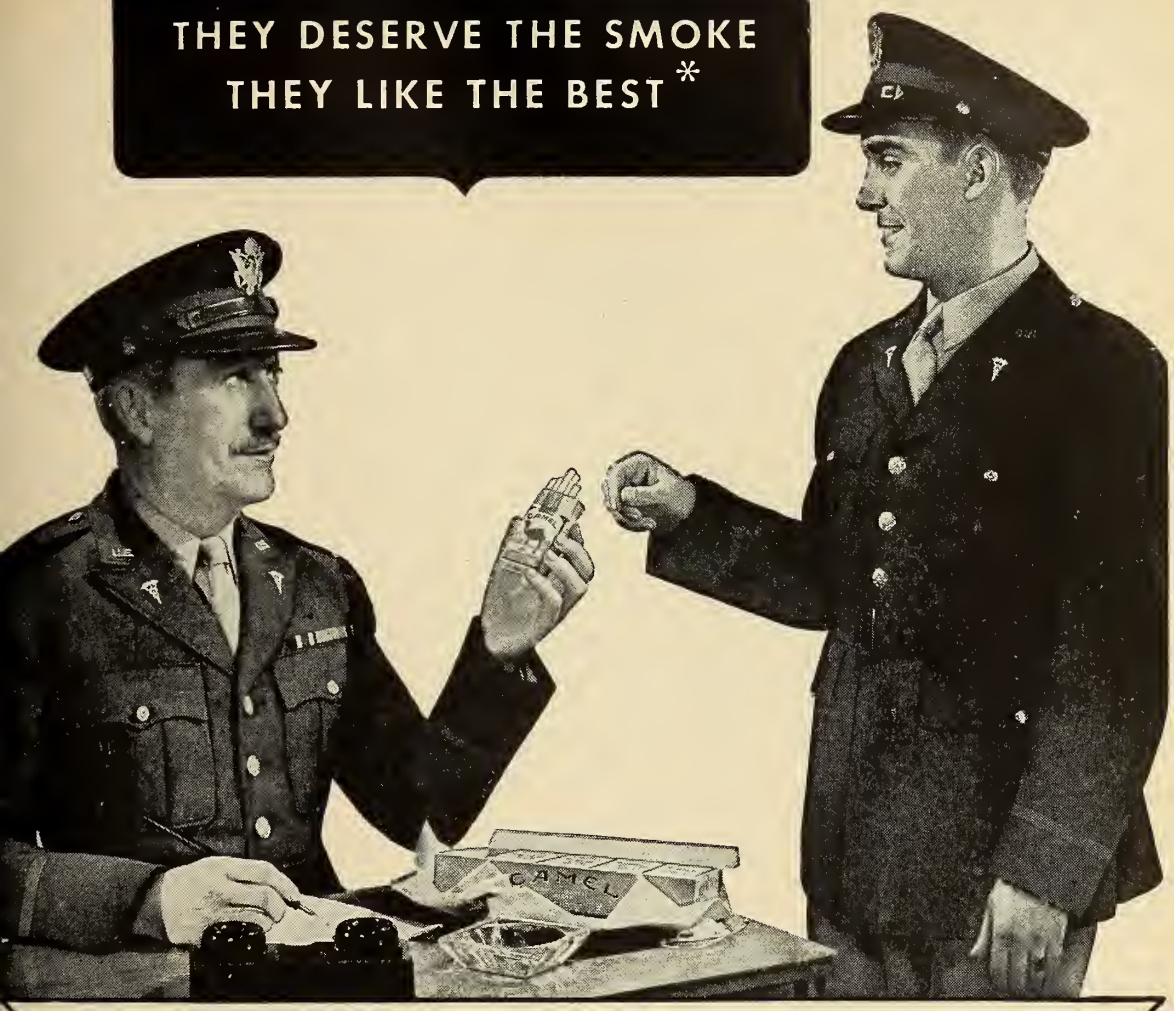
Frederick Stearns & Company

Since 1855... ESSENTIALS OF THE PHYSICIAN'S ARMAMENTARIUM

NEW YORK KANSAS CITY **DETROIT, MICHIGAN** SAN FRANCISCO WINDSOR, ONTARIO
SYDNEY, AUSTRALIA AUCKLAND, NEW ZEALAND


For
NUPERCAINAL
Sunburn
When the sunburned patient calls for help . . . NUPERCAINAL* provides prompt and prolonged relief for many hours. This well-known local anesthetic ointment is available everywhere for use under your direction.
*Trade Mark Reg. U. S. Pat. Off.
1 oz.
NUPERCAINAL
CIBA
CIBA
Pharmaceutical Products, Inc.
SUMMIT • NEW JERSEY

THEY DESERVE THE SMOKE THEY LIKE THE BEST*



YOUR gift of cigarettes to men in service is the most welcome of all remembrances. And the preferred brand, according to actual survey, is Camel.*

Send Camel—the cigarette noted for mellow mildness and appealing flavor. It's one way, and a good way, to express your appreciation of the sacrifices being made by our fighting forces.

Camels in cartons are featured at your local tobacco dealer's. See or telephone him—today—while you have the idea in mind.

*With men in the Army, Navy, Marine Corps, and Coast Guard, the favorite cigarette is Camel. *(Based on actual sales records in Post Exchanges and Canteens.)*

• • •

Remember, you can *still* send Camels to Army personnel in the United States, and to men in the Navy, Marines, or Coast Guard *wherever they are.* The Post Office rule against mailing packages applies only to those sent to men in the overseas Army.

CAMEL COSTLIER TOBACCOS

BUY WAR BONDS AND STAMPS



An Invitation
from
PHILIP MORRIS

We extend to you a cordial invitation to visit our exhibit at the meeting of the Minnesota State Medical Association, Booth No. 18. You will find our exhibit of considerable interest, both for your own smoking pleasure and your professional work.

It will demonstrate scientific methods used to determine the influence of hygroscopic agents on irritation due to smoking. It will demonstrate the distinct advantages of Philip Morris over cigarettes made by the ordinary method of manufacture.

Philip Morris & Co. Ltd., Inc., 119 Fifth Ave., N.Y.

OPTIMUM NUTRITION FOR BABY...

MINIMUM TIME FOR DOCTOR...



with this complete liquid infant formula!

BIOLAC SUPPLIES milk proteins, milk minerals, iron, and vitamins A, B_1, B_2 and D in amounts which equal or exceed recognized requirements for infants. Thus with the sole exception of vitamin C, Biolac provides *complete* nutrition for the bottle-fed baby.

Biolac is a real timesaver for overworked doctors, too! *No carbohydrate or other extra formula ingredients to calculate!*

Also, with Biolac there is less chance of upsets due to errors in preparing formulas. Less chance of formula contamination, too, because Biolac requires only simple dilution with boiled water, as you prescribe.

NO LACK IN BIOLAC

Borden's complete infant formula

● *Biolac is prepared from whole milk, skim milk, carbohydrates—Vitamin B_1, concentrate of Vitamins A and D from cod liver oil, and ferric citrate. It is evaporated, homogenized, and sterilized. For professional information, write Borden's Prescription Products Division, 350 Madison Avenue, New York, New York.*

ACCEPTED AMERICAN MEDICAL ASSN.

WHERE OLD FRIENDS HOLD REUNION—





★

Old friends of yours—products which you use day after day—fill the shelves of our Jobbed Drug Section from floor to ceiling. Such well known labels as Cutter Laboratories, J. T. Baker Chemical Company, Parke-Davis, Mallinckrodt, John Wyeth, Winthrop, Eli Lilly, E. R. Squibb, Abbott, Fritzsche Bros., Sharp & Dohme, Merck, Ciba, Upjohn and dozens of others appear on these shelves. Every type of product is included—chemicals, biologicals, ampoules, stains and reagents, volatile oils, drug room supplies, general pharmaceuticals and ethical pharmaceutical specialties.

This big stock is one of the many reasons why we are able to give you an outstanding drug service—24-hour delivery on practically every order.

While it is impossible to list all of the stocked items, a partial listing can be found in your copy of the P & H catalog. For fast, thorough service send your orders to the P & H.

PHYSICIANS and HOSPITALS SUPPLY CO. Inc.

NOT A WAR-BORN IDEA

Personalized Field Service on G-E Equipment Has Prevailed for Many Years

It is important that x-ray and other electromedical equipment be kept in tip-top operating condition during these busy days in hospitals, clinics, and physicians' offices. And to users of G-E equipment the need for expert technical and maintenance service in this wartime period has presented no problem. They continue to get it from the same G-E branch offices and regional service depots that have taken care of them for many years past.

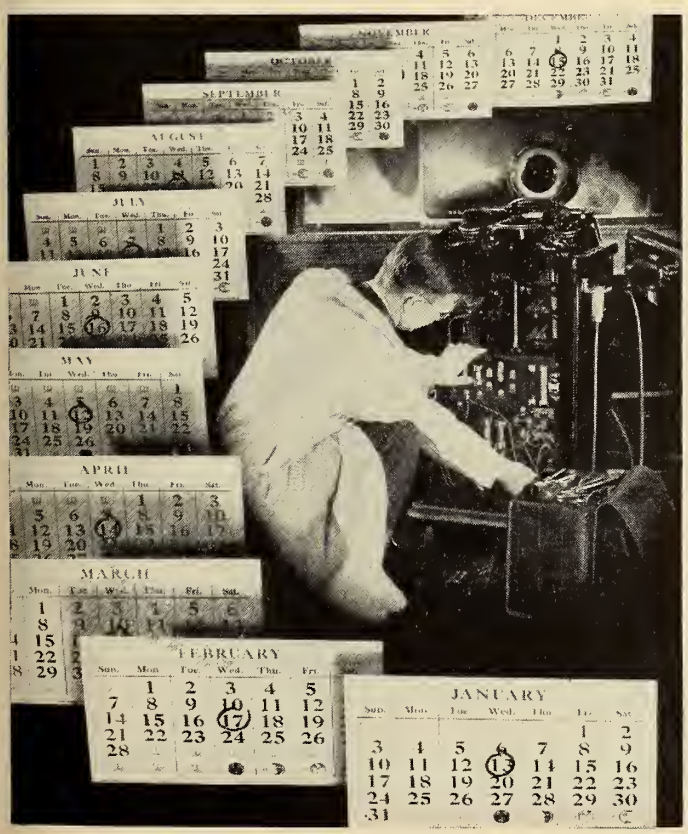
In other words, this idea of G-E field service is not something set up *just for the duration.* It is considered quite as important to G-E customers in peacetime as well.

G-E Periodical Inspection and Adjustment Service, for example, is a low-cost, year-round service that keeps thousands of G-E x-ray and electromedical units at highest operating efficiency at all times. Thus investments in fine equipment are protected, to preclude costly and annoying breakdowns.

Therefore, to present and future users of G-E equipment, this competent field service will always be available—in wartime and peacetime, both.

ARMY E NAVY

GENERAL ELECTRIC X-RAY CORPORATION



In your particular area the following G-E Branches and Regional Service Depots stand ready to serve you:

MINNEAPOLIS
321 Medical Arts Bldg.
Nicollet Ave. & Ninth St.

DULUTH
526½ East First Street

GREEN ISLE
Mr. N. E. McMahon

ST. PAUL
174 E. Sixth Street

SIOUX FALLS, S. DAK.
2028 S. Covel Avenue

FARGO, N. DAK.
712 Fourth St. S.

Today's Best Buy — U. S. War Bonds

Good News!

★ DEXTRI-MALTOSE

WITH YEAST EXTRACT AND IRON now measures 4 (instead of 6) level tablespoonfuls to the ounce

and

★ is packed 16 oz. (instead of 12) per tin

and

★ each ounce supplies 2.8 mg. iron

and

★ each ounce supplies .3 mg. thiamine

and

★ each ounce supplies .1 mg. riboflavin

During the baby's first six months, this product alone supplies to the milk formula more iron than the infant requires

and

more thiamine than the average infant requires.

Dextri-Maltose With Yeast Extract and Iron is supplied now in 1-lb. and 5-lb. cans



ALL AT NO INCREASED COST TO THE PATIENT

MEAD JOHNSON & CO.
EVANSVILLE, IND., U.S.A.



The art of anatomic illustration entered a new epoch upon the publication of the Tabulae Anatomicae of Giulio Casserio (Venice, 1627). This female figure is one of Casserio's most beautiful copperplates.



THEELIN AQUEOUS SUSPENSION

For patients requiring high potencies, and for those who do not tolerate oil injections.

THEELIN AQUEOUS SUSPENSION provides the same pure, natural crystalline estrogen as Theelin in Oil, and the same effective clinical results may be expected in the treatment of menopausal syndrome and other conditions due to diminishing estrogenic secretion. Theelin Aqueous Suspension is administered intramuscularly. Normal saline solution—no suspending agent—is used in preparing this product and the ampoule need only be shaken gently before the preparation is drawn into the syringe.

The uniform potency of Theelin is certified by the Laboratories of both Parke, Davis & Company and St. Louis University. Kapseals Theelol (Oral) and Theelin Suppositories (Vaginal) are available for maintenance therapy and for use in milder hypogonadal conditions.

•

THEELIN AQUEOUS SUSPENSION

1-cc. ampoules, each cc. containing 2 mg. (20,000 I.U.) of Theelin suspended in normal saline solution.

•

THEELIN IN OIL

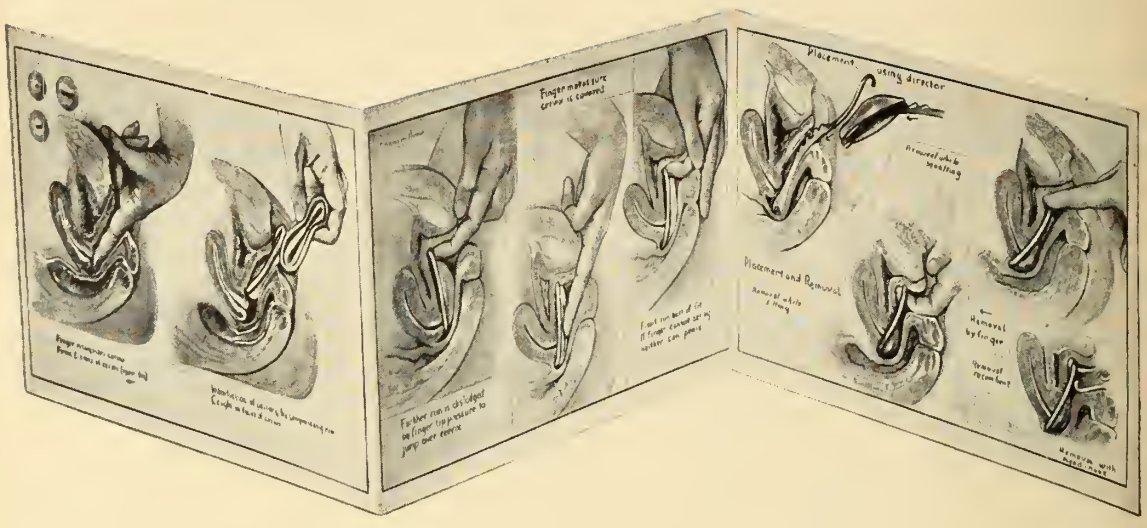
1-cc. ampoules in strengths up to 1 mg. (10,000 I.U.) of Theelin per cc.

ARMY E NAVY

PARKE, DAVIS & COMPANY

DETROIT, MICHIGAN

11th Edition Now Out *Send for Copy*



The Technique *of* Fitting Diaphragms

A series of charts in booklet form (6 x 9) clearly illustrating the technique of fitting diaphragms by the physician, now accompanied by the Dickinson-Freret Charts in two colors. For use by the physician in explaining the technique to his patient. These charts are regarded as the most helpful explanatory aid on the subject ever published. Eleventh edition now out. Write, or use coupon, for a copy.

Holland-Rantos
Company, Inc.
551 FIFTH AVENUE, NEW YORK, N. Y.

Holland-Rantos Co., Inc.
551 Fifth Avenue
New York, N. Y.

Without cost, please send your booklet on Fitting Technique to:

Dr.....

Street.....

City.....State.....

THE RISING CURVE OF PEPTIC ULCER IN WAR

"Peptic Ulcer ranks high as a cause of disability for military service. It . . . leads all other digestive diseases as a cause for discharge from the Regular Army."

Kantor, J. L.: Digestive Disease and Military Service, Jnl. A. M. A., Sept. 26, 1942.

THE increased incidence of peptic ulcer among the armed forces, defense workers and civilians today confronts medicine as a major problem.

Of the various types of therapy used to control this problem none has proved itself more valuable than CREAMALIN, brand of aluminum hydroxide gel.

CREAMALIN, the first aluminum hydroxide gel to be made available to physicians, was also the first to be Council-accepted. CREAMALIN contains approximately 5.5% aluminum hydroxide.



ACCEPTED
AMERICAN MEDICAL ASSN.
Council on Pharmacy and Chemistry

CREAMALIN
REG. U. S. PAT. OFF.
Brand of Aluminum Hydroxide Gel

Therapeutic Effects of CREAMALIN

- **Pronounced antacid action of 12 times its volume of N/10 HCl in less than 30 minutes (Toepfer's reagent)**
- **Prolonged action in contrast to fleeting effect of alkalies**
- **Non-alkaline; non-absorbable; non-toxic**
- **No acid rebound; no danger of alkalosis**
- **Prompt and continuous pain relief in uncomplicated cases**
- **Rapid healing when used with regular ulcer regimen**
- **Mildly astringent; may reduce digestive action, thus favor clot formation**
- **Demulcent; gelatinous consistency affords protective coating to ulcer**

Modern non-alkaline therapy for peptic ulcer and gastric hyperacidity

ALBA PHARMACEUTICAL DIVISION
WINTHROP CHEMICAL COMPANY, INC.
NEW YORK, N. Y.
WINDSOR, ONT.



REST HOSPITAL

A quiet, ethical hospital with therapeutic facilities for the diagnosis, care and treatment of Nervous and Medical cases. Invites coöperation of all reputable physicians who may supervise the treatment of their patients.

PSYCHIATRISTS IN CHARGE
Dr. Hewitt B. Hannah
Dr. Joel C. Hultkrans

2527 2nd Ave. S., Minneapolis, Phone At. 7369

POKEGAMA SANATORIUM

operated by

H. LONGSTREET TAYLOR FOUNDATION

Reception Hospital



Thoroughly Equipped for the
Medical and Surgical Treatment of

TUBERCULOSIS

Artificial pneumothorax, oleothorax, phrenicectomy, thoracoplasty, pneumolysis, bronchoscopy, alpine lamp and heliotherapy. Operating, throat, dental and lamp rooms. Complete clinical and X-ray Laboratories.

Electric Blankets in All Beds

A reduction has been made in rates.

Railroad, Bus, Telegraph and Telephone Stations: Pine City, Minn. Descriptive circular sent on request.

F. F. CALLAHAN, M.D., Medical Director
POKEGAMA, PINE COUNTY, MINN.

CHILDREN ADMITTED

Minimum discomfort and inconvenience to patients from . . .

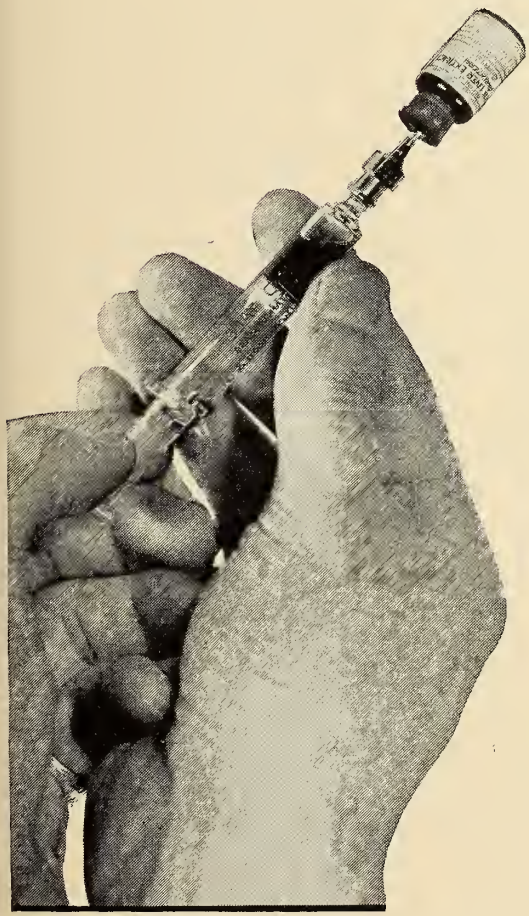
SOLUTION LIVER EXTRACT

[PARENTERAL]

Lederle

BECAUSE OF ITS SMALL VOLUME, low concentration of solids and high concentration of anti-anemic substances, a minimum of discomfort and inconvenience to the patient may be expected from the administration of concentrated "Solution Liver Extract (Parenteral) *Lederle*," (15 U.S.P. Injectable Units per cc.).

For physicians who prefer to give fewer units of active material at more frequent intervals, there is "Refined Solution Liver Extract (Parenteral) *Lederle*," 5 U.S.P. Injectable Units per cc. and 10 U.S.P. Injectable Units per cc. In addition, there is "Solution Liver Extract (Parenteral) *Lederle*," 3.3 U.S.P. Injectable Units per cc. A palatable oral solution containing not less than 1 U.S.P. Oral Unit per 60 cc. is also available.



All Lederle's Liver extracts conform to the United States Pharmacopoeia Twelfth Revision.

In the treatment of Pernicious Anemia with Liver Extract—

Specify ***Lederle***.

LIVER PRODUCTS *Lederle*

"CONCENTRATED SOLUTION LIVER EXTRACT (PARENTERAL) *Lederle*", PACKAGES:
- 3—1 cc. vials (15 U.S.P. Injectable Units each)
- 1—10 cc. vial (150 U.S.P. Injectable Units each)

"REFINED SOLUTION LIVER EXTRACT (PARENTERAL) *Lederle*"
- 1—10 cc. vial 5 U.S.P. Injectable Units per cc. (50 units)
- 1—5 cc. vial 10 U.S.P. Injectable Units per cc. (50 units)
- 1—10 cc. vial 10 U.S.P. Injectable Units per cc. (100 units)

"SOLUTION LIVER EXTRACT (PARENTERAL) *Lederle*"
- 3—3 cc. vials (10 U.S.P. Injectable Units per vial)

"SOLUTION LIVER EXTRACT ORAL *Lederle*"
- 8 fluid ounce bottle (4 U.S.P. oral units)
- 1 pint (16 fluid ounce) bottle (8 U.S.P. oral units)

LEDERLE LABORATORIES, INC., NEW YORK, N.Y.— A UNIT OF AMERICAN CYANAMID COMPANY

PYOKTANIN SURGICAL GUT

Plain and Formalized

Manufactured Since 1899 by

The Laboratory of the Ramsey County Medical Society

Packaged dry in hermetically sealed glass tubes in accordance with the new requirements of the U. S. Pharmacopœia.

• • •

Price List

PLAIN TYPE A NONBOILABLE
AND
FORMALIZED TYPE C NONBOILABLE

Sizes.....000 — 00 — 0 — 1 — 2 — 3
28 inches.....per dozen strands $2.00
60 inches.....per dozen strands $3.00

Special discount to hospitals and to the trade. Cash must accompany the order.

• • •

Address

LABORATORY RAMSEY COUNTY MEDICAL SOCIETY

Lowry Medical Arts Building, St. Paul, Minnesota

FOR SALE BY SURGICAL DEALERS AND DRUGGISTS



What is Luzier's Service?

In effect, it is a means by which thousands of women improve their appearance and maintain its loveliness. Specifically, it is a system of selecting cosmetics to suit individual requirements and preferences. It is based on a Selection Questionnaire whose answers serve as a guide to our Selection Department. It is made available by Cosmetic Consultants who are trained to assist you with the selection of suitable types of Luzier products and to show you how to apply them to achieve the best results, the loveliest appearance. A card addressed to Luzier's, Inc., Kansas City, Missouri, will be forwarded to the Distributor of our products in your vicinity. It will be her pleasure to call on you at your convenience and without obligation on your part to acquaint you with the many delightful features of Luzier's Service.

Luzier's Fine Cosmetics and Perfumes Are Distributed In Minnesota By:

District Distributors

Louise Roberts
304 Medical Arts Bldg.
Minneapolis, Minn.

Mae Nagle
Ormonde Hotel
Virginia, Minn.

Kay McCarthy
Fairmont, Minn.

Assistant District Distributor

Eva Byrne
610 3rd St. S.E.
Little Falls, Minn.

Experience



EXPERIENCE ADDS THE MASTER TOUCH IN THE PREPARATION OF FINE MEDICINAL AGENTS. ONLY WITH EXPERIENCE CAN MANUFACTURING PROCEDURES BE SO PERFECTED THAT THE ULTIMATE IN DRUG AND BIOLOGICAL PURITY IS APPROACHED. THE EXCELLENCE OF LILLY PRODUCTS IS A RESULT OF LONG YEARS OF WELL-DIRECTED EFFORT AND A DESIRE TO MARKET NOTHING BUT THE BEST.

ELI LILLY AND COMPANY, INDIANAPOLIS, INDIANA, U. S. A.

BUY WAR BONDS AND STAMPS

ARMY NAVY E

Lilly

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 May, 1943 No. 5

THE PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

Responsibilities, Accomplishments and Future Problems

HAROLD S. DIEHL, M.D.
Member, Directing Board, Procurement and Assignment Service
Dean of the Medical Sciences, University of Minnesota
Minneapolis, Minnesota

A LITTLE more than a year has passed since October 30, 1941, when the President of the United States, by executive order, created the Procurement and Assignment Service for Physicians, Dentists and Veterinarians. The reason for this order was the realization that adequate medical and health services for both military and civilian populations are essential for the effective prosecution of the war. The action was taken upon the recommendations of the American Medical Association, the American Dental Association, the Surgeon Generals of the Army, the Navy, and the United States Public Health Service, and Mr. Paul V. McNutt, as Chief of the Office of Defense, Health and Welfare Services. This makes the Procurement and Assignment Service, morally at least, responsible both to the government of the United States and the medical, dental, and veterinary medical professions of this country. In view of this it is appropriate that a brief report should be made at this time of the accomplishments of this service to date and the problems and responsibilities remaining for 1943.

In general terms, the responsibility of this Service is to plan for the distribution of the services of the physicians, dentists and veterinarians of this country so as to meet as effectively as possible the needs of both the armed forces and the civilian population during the war.

The plan of procedure contemplated by the Directing Board at its early meetings was to proceed in an orderly manner to appraise the medical personnel of this country, their qualifications, and their availability for military or civilian services in case of war. Unfortunately, the ink was hardly dry on the President's executive order before we were plunged into the midst of war. This made it necessary for the Procurement and Assignment Service to formulate policies, develop its organization, and begin to function all at the same time. There was no blueprint to follow, no past experience upon which to draw.

Organization and Administrative Relationships

Although its establishment antedated that of the War Manpower Commission, the Procurement and Assignment Service was made administratively responsible to that organization immediately upon its creation. This made the Procurement and Assignment Service what might be called the Medical division of the War Manpower Commission. Although official channels between the Procurement and Assignment Service and the War and Navy Departments are through the Director of the War Manpower Commission, the great majority of the contacts with the Army and the Navy are made directly

Read at the War Session of the American College of Surgeons, St. Paul, Minnesota, March 1, 1943.

and informally with the Offices of the Surgeon Generals of these services. In fact, the Directing Board of the Procurement and Assignment Service holds monthly meetings with the Surgeon General of the Army, the Surgeon General of the Navy, the Surgeon General of the United States Public Health Service, the Director of Selective Service and such members of their staffs as they elect to accompany them. The results of these conferences and informal relationships have been so satisfactory that very few communications through official channels have been necessary. Without this splendid understanding and effective coöperation on the part of these services, the task of the Procurement and Assignment Service would have been an impossible one.

The organization of the Procurement and Assignment Service consists of a Directing Board, a Central Office in Washington, a Consultant's office in the headquarters of the American Medical Association in Chicago, and Corps Area and State Committees, with local, county, or district committees serving in an advisory capacity. The physicians on these various boards and committees have given unselfishly and unstintingly of their time and services. Without compensation, at great personal sacrifice, and at times in spite of uninformed or malicious criticism, these men have rendered and are continuing to render an invaluable and patriotic service to our country in its war effort. It is primarily to the chairmen and the members of the State and local Procurement and Assignment Service committees that the real credit for the accomplishments of this service belongs.

With the American Medical Association and the various state medical societies, the Procurement and Assignment Service has a most intimate, though unofficial, relationship. In 1940 the American Medical Association at great expense and effort prepared a roster of all the physicians in the United States with detailed information in regard to their training, experience and qualifications. This invaluable roster was made available to the Procurement and Assignment Service immediately after its organization. In addition, the American Medical Association has made its staff and facilities available at all times to aid in the work of the Procurement and Assignment Service. In like manner, state medical societies not only have coöperated wholeheartedly, but in many instances have provided a large portion of the expenses and carried much of the work and the State and local Procurement and Assignment committees. Without this assistance and support, the work of the Procurement and Assignment Service could not possibly have been carried out. To these various medical associations we acknowledge our deep indebtedness.

Accomplishments of 1942

With the rapid expansion of our armed forces last year, the first responsibility of the Procurement and Assignment Service was clearly to cooperate with the Army and Navy in the recruitment of the medical officers which they needed. Our boys, and now our girls, whether they be in Africa, India, Guadalcanal, Australia, Alaska, or the continental United States, must be provided with the best of medical care. I am sure that everyone would agree that the provision of medical services to those who are risking and in many cases sacrificing their lives in defense of our country deserves first priority in the allocation of physicians.

Second, probably, comes the need of the medical schools for teachers to train more physicians under the accelerated program of medical education. These institutions, which have been mobilized 100 per cent for the war effort, serve as the only source of supply for additions to or replacements of physicians for both the armed forces and the civilian population.

Next, in order of priority, comes the provision of medical care for workers in the war industries. These workers must be kept on the job, producing the materials of war without which armies and navies are helpless in modern warfare.

This leaves as last on our priority list the needs of the general population for medical services. This does not mean that the civilian population will have to get along with what is left after the armed forces, the medical schools and the war industries have taken all the physicians that they want. The effective prosecution of a modern war requires the mobilization of the entire resources of the nation in support of the war effort. Under such circumstances, it is clearly necessary that a sufficient number of physicians be retained to provide essential medical services for the civilian population. Recognizing

this, the Army and the Navy have agreed not to grant commissions to physicians declared essential by the Procurement and Assignment Service for civilian medical care. Likewise, local Selective Service boards have been directed by National Headquarters to secure the recommendation of the Procurement and Assignment Service whenever they are considering the classification of a physician, dentist or veterinarian.

Recruitment of Physicians in 1942

At the outbreak of war there were approximately 13,000 medical officers on duty in the Army and the Navy. At the end of 1942, approximately one year later, this number had increased to over 42,000. The recruitment of such a large number of physicians in a short period of time was a colossal undertaking. Except for a few single men who came under the jurisdiction of Selective Service, there was no authority to compel physicians to go into the Service. What has been accomplished has been entirely on a voluntary basis. The Procurement and Assignment Service possesses no authority to say to a physician that he must go into the service or that he must stay at home. Some of the Army recruiting boards in their zealous efforts to recruit physicians presumed and even threatened to use authority which they did not possess. Actually neither these boards nor the Procurement and Assignment Service has authority to exercise compulsion upon anyone.

Early in last year it seemed for a time that physicians were slow in responding to the call for their services. But by the end of the year, over 50 per cent of the practicing physicians under 45 years of age had entered the armed services. No other professional group in this country has ever been called upon for such public service or responded to a call so magnificently.

During the first world war, the recruitment of physicians for the Army and Navy was carried on with little or no consideration for the needs of the civilian population. Many areas and communities were left without medical service, while in other areas excessive numbers of physicians remained in civilian life. To help prevent a similar situation this time, the Procurement and Assignment Service established quotas as to the number of physicians which each state was expected to supply in 1942. These quotas represented the proportionate share of the 42,000 medical officers requested by the armed forces, which it seemed equitable for each state to provide, taking into consideration the population of the state, the number of physicians in civilian practice, their ages, distribution, etc. These quotas for states with relatively few physicians in relation to population required only 10 to 15 per cent of the practicing physicians; while at the other end of the scale, the quotas of states such as New York and Illinois represented up to 30 per cent of the physicians actively engaged in civilian practice.

The country as a whole and all but five individual states met or exceeded the quotas assigned to them for 1942. From a few areas, particularly in the South, too many physicians have gone into service, leaving the civilian population without adequate medical care. Some of these physicians held commissions in the Reserve Corps of the Army or Navy and were called to active duty; others volunteered early before the Procurement and Assignment Service program became operative; others were released by the State Procurement and Assignment Committees because it seemed that there were sufficient numbers of doctors remaining to care for the civilian population. In some instances, these calculations were upset by illness or death among the remaining physicians or by the unanticipated influx of large populations in connection with war industries or war activities. I know of one county in which there were three physicians. The youngest of these was declared "available" for military service. Subsequently one of the two remaining physicians has died, and the other has had a "coronary attack," which seriously limits his availability for practice. The result is that this county is now critically short of medical service.

The Maintenance of Civilian Medical Services

In order to safeguard civilian medical services, the chairmen of the State Procurement and Assignment Committees have been directed to designate as "essential" those physicians considered necessary for the provision of essential civilian medical services.

To aid in this, *medical schools* have been authorized to submit lists of their faculty members, marking as "available" those whom they could release for service with the armed forces but listing as "essential" those who constitute the minimum staff necessary to conduct a sound

teaching program. These reports specify the subjects that each individual is teaching and the amount of time he was devoting to such teaching. All lists of "essential teachers" as submitted by the medical schools are reviewed by the Medical Education Committee and the Allocation Committee of the Procurement and Assignment Service. The opinion of these committees in regard to the lists is then sent to the chairmen of the respective State Committees who are responsible for decisions as to who is "available" and who "essential." The objective is to retain adequate teaching staffs for the medical schools, but to do so without withholding from military service more than the minimum number of men who are physically qualified for military service.

Analysis of the medical school lists which were submitted last summer for the current academic year showed that up to that time 21 per cent of the physicians on medical school faculties were in Army or Navy service as compared to 12 per cent of all the physicians in the United States. In addition, the medical schools listed as "available" 25 per cent of the physicians of military age remaining on their staffs.

Industrial medical service assumes increasing importance in connection with the war. The criteria as to the conditions under which physicians in industry should be considered "essential" were prepared by the Committee on Industrial Health of the Procurement and Assignment Service. This Committee recommended that essential industrial medical services be continued but that physically fit young physicians of military age serving in industry should be replaced as rapidly as possible by those who are not physically fit or otherwise ineligible for military service.

Public health services must be maintained for the protection of the health of the armed forces as well as of the civilian population; yet the staffs of these services contained many physicians with training and experience urgently needed by both the Army and the Navy. Epidemiologists, parasitologists, bacteriologists, statisticians, and public health administrators are urgently needed for the prevention and control of diseases among our soldiers who are serving in all parts of the world. In order that public health services might be maintained and yet as many as possible of these specialists relieved, all state, city and county health departments were requested to prepare lists of personnel, indicating which ones of military age could be released for military service and which ones are considered as essential for the effective functioning of the health department. These lists are reviewed by the Public Health Committee of the Procurement and Assignment Service.

Hospitals.—Most of the members of the clinical staffs of hospitals are physicians practicing in the community and are designated as "available" or "essential" on the basis of the importance of their services to the community as a whole rather than to any individual hospital. On the other hand, in many of the large charity and teaching hospitals, certain residents and physicians in charge of special services, such as the x-ray and laboratory departments, are essential both for the clinical instruction of medical students and for the adequate care of the hospital patients. With this group the problem again is to release as many as possible for service with the armed forces and still retain the minimum number essential for the proper functioning of the institution. To accomplish this, hospitals approved for residencies have been requested to prepare lists of residents and other physicians who were on full-time status or chiefs of large charity services, indicating those whom they consider to be the minimum essential staff of the hospital. These lists have been reviewed both by the Hospital Committee and the respective State Committees of the Procurement and Assignment Service.

"Boom Towns."—During the past year many towns have experienced a mushroom growth as a result of war industries or military or naval installations. Some of these have given rise to critical shortages of medical services. Numerous articles have been written about these areas, frequently with gross exaggerations as to their number and seriousness. In many instances the workers in these war industries are recruited from persons already residing in the area. In others, if the influx of population is not excessive, the physicians in the community are able to provide the necessary medical care. On the other hand, there are a number of areas in which the shortage of medical services is truly critical. I have visited one community which in a little more than a year has grown from 15,000 to 65,000 population and it is expected that by

July, 1943, the increase will reach 110,000. Another area which had approximately 40,000 population before the war now has 110,000 and is expected to have 145,000 by midsummer. In the country as a whole, there are a number of such areas.

Last summer and fall a number of agencies in Washington became concerned about the shortage of medical services in these areas, and numerous conferences were held to define lines of responsibility and to outline procedures to deal with the situation. On the basis of these conferences, the Directing Board of the Procurement and Assignment Service formulated certain policies in regard to the investigation of the need and the provision of medical care in critical shortage areas. These policies, which were approved by the United States Public Health Service, by the Trustees and the War Participation Committee of the American Medical Association and by the War Manpower Commission, placed the primary responsibility for the investigation of these areas and for the formulation of plans to meet these needs upon the Procurement and Assignment Service and the local medical profession, with the coöperation and assistance of the United States Public Health Service. In approving these principles, the War Manpower Commission said, "This approval is given with the understanding that the plan places a grave responsibility on the organized medical profession, and that the Procurement and Assignment Service has the obligation of assuring that this responsibility is effectively discharged."

To meet these responsibilities, the Directing Board requested detailed reports from the State Chairmen concerning changes in population, the medical personnel, and the medical and health facilities available and needed in communities or areas in which there are war industries or war activities or in which there is a known or expected shortage of medical services. In investigating the needs of these areas, the State Procurement and Assignment Committees are advised to seek the "coöperation of the state medical societies, the state dental societies, the state health officers, of industry, of organized labor, and of other agencies, such as the State Defense Council, which should be able to make significant contributions to the solution of this problem." In addition, the Surgeon General of the United States Public Health Service has directed the regional representatives of this Service to cooperate in the conduct of these investigations.

When these investigations reveal a need for additional physicians or other medical or health facilities or personnel, the principles provide that: "Whenever possible civilian needs as determined by these committees should be met through local arrangements, resources, and agencies. In case assistance is needed for the organization, administration, or financing, of necessary medical services in these areas, the responsibility for formulating the plan best suited to each particular situation should devolve upon an agency which should include representatives of the state health department, the state medical society and the state dental society with the coöperation and support—financial and technical—of the appropriate federal agencies; the administration of such plans to be delegated to the appropriate official state agency." It is recognized that the United State Public Health Service is the federal agency which will be responsible for the provision of funds or personnel which may be required to provide the necessary health services in these areas.

In the formulation and execution of this program, there has been complete harmony and cooperation between the Directing Board of the Procurement and Assignment Service and the United States Public Health Service as represented by Surgeon General Thomas Parran and Assistant Surgeon General Warren Draper. Before the close of 1942, this program was inaugurated as a coöperative enterprise between the medical profession, the Procurement and Assignment Service, and the United States Public Health Service.

Problems of the Procurement and Assignment Service for 1943

The end of the year means little in war except to provide a convenient point at which to end and begin reports. Similarly, the responsibilities and the problems which faced the Procurement and Assignment Service in 1942 carry over into 1943. Changes in emphasis occur, but these are gradual and related to the over-all situation. The recruitment of additional physicians to serve with the armed forces and the maintenance of essential civilian medical services are still our major responsibilities. During the past year, however, there have been important

changes in the situation confronting us. A year ago we had what seemed to be an almost unlimited supply of physicians; the needs of the armed forces for medical officers appeared easy to fill; war industries were just beginning to draw workers and their families from far and wide; and there seemed no problem of providing medical care for the civilian population.

With the advent of 1943, an analysis of the physicians of the country revealed that the statement about our having 180,000 physicians was misleading; and that withdrawals from this group were already approaching the limit of the available supply. The figures show that we do have a total of approximately 180,000 physicians registered in the United States. Of these, however, approximately 15,000 occupy full-time positions in public health departments, medical schools, insurance companies, or other governmental or private agencies not engaged in the practice of medicine; 28,000 are over sixty-five years of age, and for planning purposes are counted as only one-third effective by the Procurement and Assignment Service; it is estimated also that approximately 5 per cent, or a total of 7,000 of the physicians under sixty-five are completely or partially ineffective; 3,000 are resident physicians in hospitals; and approximately 42,000 were in the armed forces on the first of January. This leaves only about 94,500 effective physicians remaining in civilian practice. There are areas in most states which have never had more than one doctor for two, three, or even more thousands of people. We cannot hope to bring about the millenium in these areas during the war when there is an over-all shortage of physicians. On the other hand, in areas in which a shortage of physicians has been created by the war a ratio of 3,000 or more people per physician is considered by the Directing Board as probably constituting a critical situation. On a basis of this over-all ratio of one physician for 1500 population, approximately 83,000 physicians are needed to provide essential medical services for the civilian population. This leaves only 11,500 physicians who can be considered as "available" from civilian practice in 1943 to enter the military services. In addition, between 4,000 and 5,000 hospital interns and residents will become available for military service during 1943.

Recruitment for the Armed Forces

On the basis of their established tables of organization, the authorized expansion of the Army and Navy in 1943 would require between 40,000 and 45,000 additional medical officers. In spite of this, both the Surgeon General of the Army and the Surgeon General of the Navy have accepted the above computations as to the number of physicians who can be safely withdrawn from civilian practice. This means that they will have to adjust their plans of organization and operation so as to get along with less medical officers than they consider ideal. Both the Army and the Navy, however, are willing to make these adjustments.

In accepting the recommendations of the Procurement and Assignment Service as to the number of physicians to be recruited from the civilian population in 1943, the Army and Navy have placed upon this Service, and through it upon the medical profession, the responsibility of recruiting available physicians up to this number.

As a guide in this recruitment, tentative state quotas for 1943 have been set up. These quotas are based upon the physician-population ratio in the state after the 1942 quota was met. Credit was given for physicians recruited in excess of the 1942 quota, while deficits on the 1942 quota were added to the new quotas. According to these computations, fourteen states have no quotas and only fifteen states have quotas of more than a hundred physicians for 1943.

The fact that some of these states have had no second quotas does not necessarily mean that no more physicians from these states should enter military service. Even in those states in which there is an over-all shortage of physicians, there probably are metropolitan areas from which some physicians can and should be released. If other areas within these states are critically short of physicians, efforts should be made to induce some of the available physicians from the metropolitan areas to move into these shortage areas. If they are unwilling to do so, they should be declared available for military service and persuaded to apply for commissions.

As a basis for future planning, State Procurement and Assignment Committees have been asked to re-appraise the physicians remaining in their states as to their availability or essentiality,

their age, professional qualifications, physical capacity, and family responsibilities. As soon as these surveys have been completed, summary reports will be sent to the Central Office of the Procurement and Assignment Service, and revision of certain state quotas may be made.

Recruitment Procedure

The Procurement and Assignment Service proposed and the Army agreed that recruitment in 1943 should be done by the Procurement and Assignment Service instead of by Army recruiting teams. Briefly summarized, the procedure agreed upon is as follows: The State Chairmen submit monthly lists of available physicians to the Central Office. From this office letters are sent to these physicians, requesting them to apply for commissions and enclosing cards addressed to the State Chairmen, indicating their preference for Army, Navy, or Air Corps service. The names of those choosing Army service are sent to the nearest Army Officer Procurement Board, which supplies the necessary application forms and authorizes physical examinations. A similar procedure is followed for those who prefer to serve in the Navy. In case a physician does not apply for a commission when requested to do so, it is the responsibility of the Procurement and Assignment Service, in coöperation with the local medical society, to induce him to accept the assignment which he has been given.

Some predict that it will be difficult to secure the number of physicians agreed upon for the armed forces in 1943. They point out that most of those who really want to serve are already in service. This is doubtlessly correct, but we feel certain that many more physicians will be willing to go when they are told specifically and individualy that their services are needed. For others some persuasion may be necessary. As a whole, the medical profession has responded magnificently to our country's call. It is but a very small minority who would place selfish interests above professional and patriotic responsibilities.

A few days ago, however, I heard of a young physically fit physician who left a hospital residency to go into private practice. To one who asked him about army service, he replied that his draft board would defer him. Upon such individuals it would be possible for the Army, Navy, and Selective Service to exert pressure. To do so, however, would require the issuance of general directives that would reflect unfavorably upon the medical profession as a whole. It is our hope that medical societies will set up local committees to coöperate with the Procurement and Assignment Service in the recruitment of those physicians of military age who are considered available for service with the armed forces. As a specific plan of procedure it is recommended that the officers of county medical societies act as committees to make personal contact with these physicians who are requested by the Procurement and Assignment Service to apply for commissions.

The time has come when every physically fit, available physician under forty-five years of age is needed to care for the boys who are risking their lives in the service of our country. Quoting a statement which Dean Thorald Sollmann of Western Reserve University made to a recent graduating class in his medical school: The time has come when "it doesn't matter much that someone else evades his obligation. Each must live with his own conscience; and he who has none is missing something. Patriotism is what you give, not what you get; and what *you* give, not what the other fellow gives or withholds. And if it should turn out, as it may in a topsy turvy world, that he gets the plums and you get the husks, well—, a good doctor can lead a useful and satisfying life anywhere and anytime without plums."

Meeting Civilian Medical Needs

The problems of civilian medical care are becoming increasingly acute as more and more physicians are taken into the armed forces. This country has more physicians in relation to population than any other country in the world, and there will be plenty available to provide essential, though not luxury, medical services for both the armed forces and for the civilian population if their services are properly distributed and utilized economically and efficiently. At the beginning of the war, there was approximately one effective private practitioner of medicine to every 1,022 persons in the United States. At the end of 1942 this figure had increased to 1 to 1,361, and by the end of 1943 it will be approximately 1 to 1,500. It is reported that England has 1 physician to approximately 230 persons in the armed forces and 1 physician to 2,700 in the ci-

vilian population. In this country the corresponding figures at the present time are approximately 1 to 160 for the armed forces and 1 to 1,400 for the civilian population. Germany is said to have approximately 1 physician to between 8,000 and 12,000 population. From this one can only conclude that the United States is relatively well off in terms of medical care both for the civilian population and for the armed forces.

As stated earlier, at the end of 1942 more than half of the practicing physicians under 45 years of age in this country were in the Army or Navy. By the end of 1943 practically all of those remaining who are physically fit and can be spared from civilian practice will be required to meet the minimum needs of the armed forces. This is the age group which is most active in medical practice and carries the biggest load of medical care. With them no longer available, the public is certain to feel a shortage of medical care. These shortages, however, need not be serious if the services of the remaining physicians are utilized intelligently and efficiently.

To do this it is important that patients do not call physicians unnecessarily and that, so far as possible, when they need a doctor they make appointments in advance so as to conserve the physician's time. It will be necessary also for physicians individually and as a group to plan to provide the public with essential medical services, whether they be in the office, the hospital or the home. Most physicians will need to add to their already long hours. Many who have completely or partially retired from practice will have to "carry on" once again. And all will have to share the responsibility for the medical services, including house calls, which normally would be rendered by the physicians who are now in service.

Medical Schools.—The students in medical schools are almost all members of the armed forces. Their education must be continued on an effective level. The lists of essential teachers submitted by medical schools indicate that some schools have already lost so many members of their faculties that it will be difficult, if not impossible, for them to conduct a satisfactory instructional program. Other schools have been more conservative and can release additional physicians in 1943 toward meeting the needs of the armed forces.

War Industries.—The continued expansion of war industries is creating an increasing demand for physicians. The Procurement and Assignment Service and the Council on Industrial Medicine of the American Medical Association are attempting to coöperate with the war industries in securing the physicians which they need. Efforts are being made, however, to secure physicians for these industries who are not eligible for military service and to replace as rapidly as possible the physicians in these industries who would be eligible for such service.

Public Health Services.—Most health departments are already functioning on skeleton staffs and are unable to release additional physicians for military service. In fact, some health departments are so urgently in need of trained personnel, that the United States Public Health Service is supplying such personnel on a "lease-lend" basis.

Hospitals.—The situation in the hospitals will become increasingly difficult. In order to conserve the time of physicians, there will be a tendency to hospitalize more patients. Medical school graduates who hold commissions in the Army and Navy will be granted a year, but only a year, of internship before being called to active duty. One result of this is that many of the large hospitals which previously had two-year internships are taking more first-year interns in order to "cover" their services. This can only mean that some hospitals will have less interns than normally.

Hospital residencies will be continued, but the number of residents who can be deferred from military service will be very limited. Consequently, hospitals will find it necessary to depend, almost entirely, upon residents who are not acceptable for military service.

Critical Shortage Areas.—It is estimated that approximately 6,000,000 people in this country have moved their homes as a result of the war. The provision of medical and health services to this group is one of the most important problems facing the medical profession and the Procurement and Assignment Service today. The principles and procedures for evaluating and meeting the needs of these groups were formulated in 1942, but most of the job still remains to be done.

The surveys which have been completed indicate that in many instances the urgent need is not for more physicians, or not only physicians, but rather for hospitals, nurses, or public health services. In a considerable number of areas the local medical societies in coöperation with public health departments and housing and welfare groups have been able to meet the needs for physicians either by having the doctors in the community or in neighboring communities give specific amounts of time to the shortage area or by inducing other physicians to move into the area. Reports from the states indicate that more than 900 physicians have taken positions in war industries or moved into "shortage areas" during the past year and that approximately two-thirds of these moves have been the result of efforts of State or local Procurement and Assignment Chairmen or Committees. Similar methods doubtlessly can and will meet these needs in many other communities.

Some of the "boom town" communities, on the other hand, need considerable numbers of physicians as well as hospital beds, nurses, and other health services. Although the ratio of 1 doctor to 1500 population has been utilized by the Procurement and Assignment Service for planning purposes as the over-all number of physicians required to provide essential medical services to the civilian population, in shortage areas, a ratio of 1 to 3,000 has been accepted as the coverage beyond which the situation would be considered critical.

The responsibility for formulating plans to meet these needs has been placed primarily upon the Procurement and Assignment Service and the state and local medical societies. Most of the residents of these areas are earning good incomes and should be able to support physicians on a private practice basis. If it is necessary in special situations to provide partial subsidy to a physician for a limited period of time to enable him to move into such an area and establish himself in practice, funds for such subsidy may be requested from the United States Public Health Service. In some areas pre-payment plans for medical services under the supervision of the state medical society are meeting the need. In rare instances it may be necessary to assign an officer of the United States Public Health Service to practice temporarily in the area. Such an assignment, however, will be made only as a last resort and upon the joint recommendation of the Procurement and Assignment Service and the United States Public Health Service.

In meeting these situations the medical profession is faced with a new responsibility. Medical societies have always been concerned with keeping their members abreast of new development and progress in medicine and with the maintenance of high standards of ethics and practice among their members. Never before have they had reason to feel responsibility for the availability or adequacy of medical care for the general population. The laws of supply and demand have largely taken care of that. Now, however, the war has given rise to a new problem of medical care which must be met. The physicians of this country are given the opportunity of meeting these needs in the way that one deems best. We sincerely hope and believe that they will be able to meet this challenge.

Conclusion

As the representative of the Directing Board of the Procurement and Assignment Service, I welcome the opportunity this occasion has provided to briefly summarize the major problems which confront each and everyone of us in the medical profession in the critical times remaining before our country can emerge victorious in the titanic struggle in which we are engaged. In meeting such responsibilities, the medical profession has always done its full share, and we are confident that, come what may, the physicians of this country can be depended upon to do their share and more in meeting their problems and responsibilities.

SURGEONS WILL SEW WOUNDS WITH NYLON SUTURES

Nylon sutures will be used by surgeons this year to sew war wounds, replacing Jap silk formerly used, E. I. du Pont de Nemours and Company announced.

Millions of feet of the plastic filament formerly produced for tennis racquets and fishing leaders are now being made for surgical sutures and large quantities are being shipped to United Nations' medical depots throughout the world.

Nylon filaments are solid strands, in contrast to braided silk sutures. It is claimed that germs from infected tissue are not absorbed and cannot travel through the nylon as through braid.

The synthetic is also inert, non-irritating and does not fray or splinter, the company reports.—*Science News Letter,* April 10, 1943.

COLLAPSE THERAPY IN TREATMENT OF PULMONARY TUBERCULOSIS

G. A. HEDBERG, M.D.

Nopeming, Minnesota

ONE need not dwell on the importance of collapse therapy in the treatment of pulmonary tuberculosis, as these measures have become well established throughout the country, particularly during the last ten years. The primary indications for collapse therapy are: (1) persistent cavity failing to close on bed rest; (2) progressive lesions failing to show evidence of retrogression on bed-rest regimen; and (3) in pulmonary lesions found in the adolescent individual. We at Nopeming, at least, have felt as a result of many years' observation that our conservative treatment of pulmonary tuberculosis in the teen-age group has been very unsatisfactory. We have become inclined to use collapse therapy, particularly pneumothorax, in all lesions in younger individuals showing definite signs of activity. The contraindications to this type of treatment are few and consist mainly of extreme toxicity with high febrile reactions, and such massive involvement that it is obvious that no sacrifice of any respiratory reserve may be made.

Pneumothorax is the ideal measure of collapse therapy; it is easy to induce; the collapse of the lung can be regulated without much difficulty; and even after the patient has left the sanatorium, the contact with his physician due to the necessity for refills is a great advantage in preventing a possible reactivation of his disease. Unfortunately, pneumothorax is satisfactory in only a minority of cases. Many times previous pleurisy has resulted in complete fusion of the pleura, which prevents induction of pneumothorax. More commonly, pleural reactions have resulted in adhesions which prevent collapse of the diseased lung, and the continuation of air refills in this type of case is not only useless from the standpoint of controlling the disease, but is very apt to be accompanied by complications of effusions and empyema.

In reviewing our experience in the induction of pneumothorax over the past two years (June 1, 1940, to June 1, 1942), we find that we attempted induction of pneumothorax in 158 individuals. Of this group, the staff considered that collapse was satisfactory in only thirty-nine (25 per cent). In forty-seven (30 per cent) pneumothorax was followed by an intrapleural pneumonolysis to sever adhesions. Twenty-four patients had pneumothoraces established, only to be abandoned as ineffective. This represents 15 per cent of the group. No space was established in 30 per cent (forty-eight cases). It is quite significant that this most ideal measure of collapse therapy when applied to the average run of patients admitted to a sanatorium is successful only in a minority of the cases. To the end of improving or substituting for this procedure, other methods of collapse therapy have been developed. At the present time we feel that the operation of intrapleural pneumonolysis, that is, severing of adhesions which prevent complete collapse, is our most valuable single procedure, and better than doubles the number of successful pneumothoraces. This operation can be done with very little reaction to the patient, and by proper supervision of the after-care, complications, primarily of fluid or bleeding, can be held to a minimum. During the past two years, eighty-four intrapleural pneumonolyses have been performed on sixty-one patients. I am not going into a complete description of this procedure except to say that very often it is safer to sever only part of the adhesions at one time, going in at a later date to complete the lysis when subsequent adhesions have been allowed to stretch more completely. Originally, we severed adhesions several months after induction of pneumothorax, but during the past two years we have usually performed this operation three or four weeks following induction of pneumothorax. By doing this, we feel we are preventing pleural effusions resulting from partial spontaneous tear of adhesions due to attempts at increasing collapse of the underlying lung. As we have become more familiar with this procedure, we have broadened its indication until we are quite willing to perform this operation in all cases in which adhesions interfere with collapse of the pathologic area regardless of whether the cavity has been closed or not.

From the Nopeming Sanatorium, Nopeming, Minnesota.
Read in the Symposium on Tuberculosis at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 1, 1942.

I have gone into more complete discussion of this indication in an earlier paper.

The classic surgical collapse when pneumothorax has failed has always been thoracoplasty. This measure is well established in many programs of collapse therapy. During the past two years, we have performed thoracoplasties on twenty-five patients. This procedure, as you all know, has marked limitations in that the underlying pulmonary pathology must be fairly quiescent, of a fibroid type, and the contralateral lung must be quite adequate, as extensive rib resection throws the underlying lung entirely and permanently out of respiratory function. It is not necessary to dwell on the advantage of completing thoracoplasty in multiple stages; seventy-seven stages of thoracoplasty were used in completing the twenty-five cases mentioned. With care in handling the tissues during the operation and the patient preoperatively as well as after operation, this extensive surgical procedure is accompanied by surprisingly little shock to the patient.

Extrapleural pneumothorax has definitely established itself in our program of collapse therapy. We grant that the experience with this procedure varies greatly in different institutions and in reports by different chest surgeons. We have been extremely fortunate in our results and feel that this is a very satisfactory procedure when it can be carried out. I personally feel that one of the major reasons for its success in our hands is that it is done at the sanatorium and that the after-care which is extremely important is the responsibility of men thoroughly trained in the problems of pneumothorax. This procedure has distinct advantages. It can be carried out bilaterally, or in the presence of extensive collapse on the other side. Then too in most cases a minimum of good lung tissue is sacrificed in order to get a maximum collapse of the diseased lung. The operation itself is about as extensive and entails as much reaction, so far as the patient is concerned, as an upper-stage thoracoplasty.

My usual procedure in performing this operation is to remove a posterior portion of the third or fourth rib on the affected side, developing the lysis in the extrapleural space. In most cases a successful lysis can be carried out even though the x-ray appearance is that of a chronic fibroid lesion. However, if one finds that he cannot strip the lung, the procedure may be abandoned without having caused too much risk to the patient. The lysis is usually carried out to create a more than adequate collapse of the lung, and during the period of the next week or two the lung is allowed to partially re-expand in this region until it is felt that the most efficient type of collapse is being maintained. One must realize that hemothorax is always a complication of this operation and bloody effusions should be aspirated and irrigated vigorously until the space dries.

During the past two years we have performed this operation twenty-seven times on twenty-two patients. One patient had two-stage lysis on her right side and a single-stage operation on her left side. Four of these patients had bilateral pneumonolyses performed for the production of extrapleural pneumothorax. We have not been inclined to use paraffin pack as we feel that extrapleural pneumothorax is the preferable procedure in any case in which paraffin pack is indicated. The maintenance of collapse of the extrapleural pneumothorax is not particularly difficult when handled by experienced men. In many of these cases oleothorax has been added without complications.

Mainly to emphasize our declining respect for operations on the phrenic nerve, we performed only fourteen phrenic nerve operations, all except one of which were crushing of the phrenic nerve for temporary paralysis. We feel that the results of this procedure have always been questionable and that the damage to the respiratory mechanism, particularly if one is contemplating more extensive surgery at a later date, outweigh the advantage of this procedure. I have not attempted to discuss oleothorax and mention pneumoperitoneum only in passing to say that the results of this procedure have been very questionable in the opinion of our staff.

The intensification of "early diagnosis" campaigns and the widespread use of mass x-raying in war industry and armed service can result only in the discovery of more and more tuberculosis among the apparently healthy. It is obvious that a large proportion of these cases will be preclinical, in the old meaning of the term. Today we must modify our terminology to acknowledge that tuberculosis found early deserves and demands early treatment. Finding the disease in a stage devoid of symptoms imposes on us the obligation so to appraise cases and so to select treatment that development of symptoms will not occur and spread of tuberculosis will be prevented—*Tuberculosis Abstracts,* May, 1943.

CHEST CONDITIONS SIMULATING TUBERCULOSIS

E. R. CROW, M.D.

Ah-Gwah-Ching, Minnesota

IN the statistics covering admission to the Minnesota State Sanatorium during the past six calendar years there were 1,736 new admissions of which 103, or approximately 6 per cent, were found to be nontuberculous. Accurate diagnoses on all of the cases in this group could not be made, but clinical tuberculosis was ruled out by repeated Mantoux tests and by sputum smears and cultures. Special procedures such as bronchograms and bronchoscopy revealed bronchiectasis and tumor in some of them; serological examinations, clinical progress, x-ray studies and occasional autopsy reports all contributed assistance in the matter of establishing diagnoses other than tuberculosis.

I shall attempt to give a brief description of the significant diagnostic features that must be kept in mind if we are to avoid mistakes in differentiating some conditions which may be confused with pulmonary tuberculosis. It should be emphasized that the roentgenogram is not always the most reliable factor in making a diagnosis. Without a satisfactory history, some observation of the patient and laboratory studies, a single chest plate may be actually misleading unless read by an individual possessing more than average skill in interpretation.

Read in the Symposium on Tuberculosis at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 1, 1942.

Acute Pneumonia

A roentgenogram taken of a 5-year-old child on admission (Fig. 1-a) showed a shadow of fairly even density occupying the greater portion of the right upper lung field. This could have represented a pure first infection tuberculosis but the rapid clearing after two weeks was inconsistent with that disease, although the Mantoux test in this child was positive. No examination of pharyngeal secretions for pneumococci was made but stomach washing cultures showed no tubercle bacilli. In typical lobar pneumonia, the x-ray density is usually homogeneous and corresponds in outline to the anatomical boundary of the lobe involved; often, however, the lobe may not be completely consolidated. Lateral views are important in middle lobe involvement. Haziness of the upper edge of a lower lobe consolidation seen on anteroposterior films can be due to the fact that the upper portion of the lobe tapers upward to a relatively thin segment and thus casts a lighter shadow than the base. Figure 1-b illustrates the amount of clearing and resolution that can occur in the short period of two weeks.

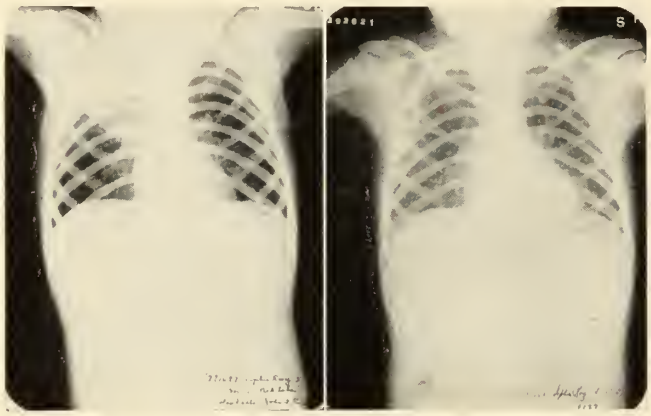


Fig. 1. (a) Pneumonia of right upper lobe. (b) After two weeks.

The second case is of a woman, aged forty-six, who had a history of loss of weight and strength over a period of five years. She had symptoms of hyperthyroidism, with subsequent

diagnosis of adenoma of right lobe and paralysis of the right vocal cord. She refused operation.

She had no cough, but complained of night sweats and was brought to the Sanatorium with

The x-ray diagnosis of the multiple irregular or fused areas of density produced by bronchopneumonia, is difficult and should not be attempted without noting the changes at frequent in-

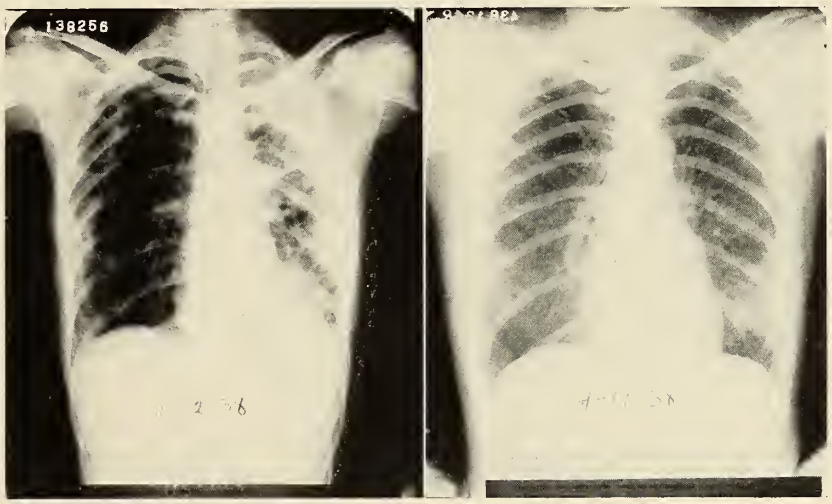


Fig. 2. (a) Atypical infiltration of entire left lung area simulating bronchopneumonia. (b) After three months.

suspected tuberculosis. Examination showed dullness and impaired resonance over the left upper lobe anteriorly (Fig. 2-a). Moist râles could be heard over this area. Tachycardia was present but the heart was otherwise negative.

Sputum examinations were negative, but blood smear showed a leukocyte count of 13,000 with 44 per cent eosinophiles. Urine and stool examination also proved negative for tubercle bacilli. Examinations of the stools for ova, parasites and typhoid bacilli proved negative.

After three months the eosinophile count had dropped to 11 per cent with clearing of the lung fields (Fig. 2-b). The sedimentation rate dropped from 26 mm. to 5 mm. and during this period she gained 35 pounds in weight. A short time later, the differential blood count was entirely normal.

Elson and Inglefinger recently reported two patients having a syndrome of atypical pneumonitis and eosinophilia associated with immune reactions to Brucella Abortus, in significant dilutions. The cases described showed positive skin tests also, although it is stated that this may have indicated only a previous brucellosis infection and not an active infection. They also cite several other sources dealing with the presence of an eosinophilia in connection with acute pulmonary infections.

tervals on serial films. Smears, sputum and cultures should always be obtained.

Silicosis

Figure 3 is that of a man forty-eight years of age who had a dry cough and dyspnea, becoming progressively worse during the period of a year. He stated that the symptoms followed an attack of pneumonia. During the time of his stay in the sanatorium he had a long series of negative sputum and culture reports. He died nine months after this picture was taken. The heart appears to be dilated on this film and he was found to have right ventricular dilatation on autopsy.

We see bilateral, evenly distributed areas of density equal in degree although irregular in shape due to their confluence and large numbers. There are no shadows of annular type suggestive of the cavities seen in tuberculosis. This is the nodular type of silicosis. Earlier stages of the condition, which is a chronic inflammatory reaction of the lungs to a nonbacterial agent, will demonstrate the principal x-ray diagnostic features which consist of:

1. Enlargement and increased density of hilar glands.

2. Bilateral lower and midlung areas of linear density radiating from the hilus which represent

perivascular and peribronchial lymphatics choked with phagocytes and, according to Cole, strands of collagen deposits around the bronchi and blood vessels radiating to the periphery.



Fig. 3. Silicosis involving both lungs.

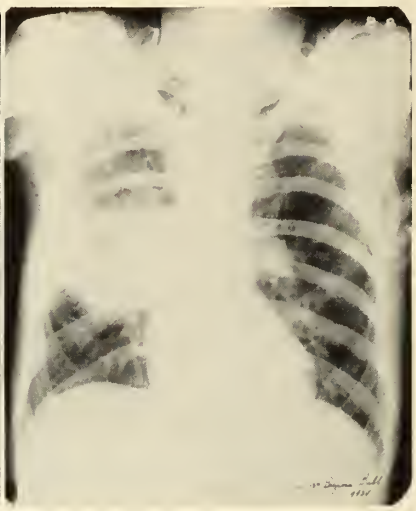


Fig. 4. Lung abscess involving right lung.

3. Silicotic nodules averaging 2 to 6 mm. in size, having the same distribution and said to consist of laminated collagen deposits. Involvement of the upper lung fields is usually found only in cases with a history of long exposure. Large numbers of silicotic nodules will produce the appearance of coalescence, as they grow together or become superimposed on the film.

Serial x-rays following hospitalization show no absorption of the nodules and little or no other change over long periods of time. Laboratory examinations are not of much value in diagnosis except to help rule out other conditions. Silicosis must be suspected and seriously considered in cases presenting a history of long exposure to silicate dust and having x-ray findings compatible with this disease, even though the presence of tuberculosis has already been established. Tuberculosis frequently complicates silicosis.

Pulmonary Abscess

Figure 4 is of a man fifty-five years of age with a significant history. Onset of symptoms began with an abscess of the tongue which ruptured spontaneously four months previous to x-ray. He complained of cough and expectoration of foul smelling sputum in large amounts—his illness being of the acute, stormy type. He was extremely toxic. Several sputum smears and cultures were negative for tubercle bacilli; the predominant organisms found were hemolytic streptococci. The Mantoux test was positive only in dilution of 1 to 100. Death occurred two months following admission and autopsy disclosed a large right lung abscess with a terminal bronchopneumonia of the lower lobes.

A pulmonary abscess is usually unilateral and found in the lower or midlung field. The history is that of aspiration of foreign bodies or infectious material, infarcts following thrombosis or peripheral suppurative lesions. Abscesses frequently occur following operations upon the upper respiratory tract. Modifications of the physical findings will be definite if the abscess is large, but none is pathognomonic of this condition.

X-ray will show the abscess shadow as a dense circumscribed area, thick-walled and usually containing fluid. The upper lung fields will be clear. A large, single tuberculous cavity in the lower lobe may be the principal source of confusion These are thin-walled, less frequently show a fluid level, and we expect to find tuberculous lesions elsewhere in the lung. If sputum is raised, the stained smear should show tubercle bacilli in large numbers. Sometimes the sputum is negative for tuberculosis and scant in quantity, from which we may infer that the bronchus is obstructed. With careful technique, bronchograms following lipiodol instillation are very helpful in demonstrating such obstruction. Not infrequent-

ly coughing will serve to loosen a bronchial plug, drainage will be established and tubercle bacilli will be found in subsequent smears.

Bronchoscopy may be indicated for diagnostic purposes, for aspiration of contents or for the removal of foreign bodies.

With good drainage, lung abscesses may diminish in size but thorocotomy with external drainage is sometimes necessary.

The evaluation of the Mantoux test here, as in other conditions, depends upon the age of the patient and other factors.

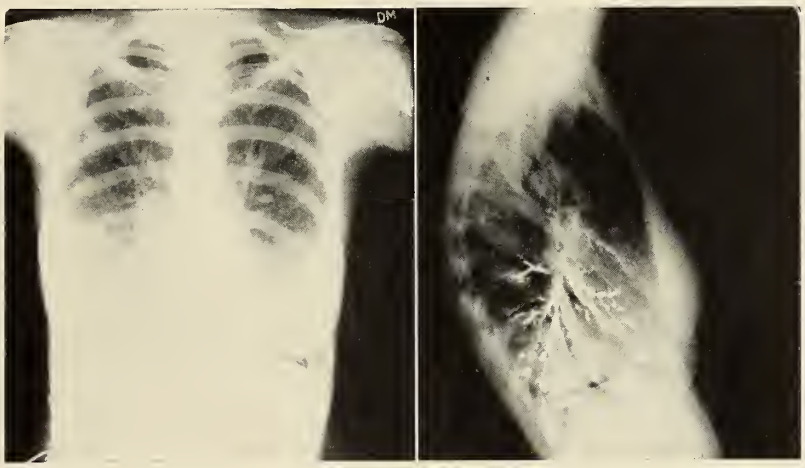


Fig. 5. (a) Antero-posterior view of patient with bilateral bronchiectasis. (b) Lateral view.

Bronchiectasis

In Figure 5 is shown the chest picture of a woman twenty-seven years of age before and after the instillation of lipiodol into the lower lobe bronchi. The history is that of a chronic cough with considerable expectoration over a period of twelve years, with loss of weight and debility. Occasionally the sputum was blood streaked. She was studied for a time and her sputum reports and cultures were consistently negative for tubercle bacilli. Her Mantoux test, however, was positive.

This is the typical picture of bronchiectasis, a condition characterized by dilatation of the bronchi. It may be associated with tuberculosis or with other pulmonary disease. It is a chronic and permanent structural change, and seems to depend on factors which tend to obstruct the drainage of the bronchus and is thus frequently seen in connection with intrapulmonary tumors, aneurysms, and enlarged hilus glands. Lower lobe bronchi are most commonly affected, and if upper lobe bronchi are involved, tuberculosis is more apt to be associated. Hemoptysis is a common symptom.

The bronchogram demonstrates the condition most readily, but the plain films often lead one to suspect bronchial dilatation. On the antero-posterior view in this case there will be seen fan-like linear densities radiating from the hilus downward to the lower lobes.

This film is likewise a good example of bilateral bronchiectasis, also apparently nontuberculous. The patient was a fifteen-year-old boy with a negative Mantoux test with 1 to 100 dilution and a negative guinea pig culture.

The history of these patients is that of a chronic cough with copious expectoration, recurring episodes of acute respiratory infections. It should be kept in mind that x-ray films of these patients may also show areas of atelectasis, abscess, evidence of bronchial tumor, abnormalities of the cardiac shadow or foreign bodies.

Carcinoma of the Lung

Primary bronchogenic carcinoma or secondary metastatic involvement of the lung may simulate tuberculosis. The same may be said of benign tumors. Cough, pain, sputum production, hemoptysis and constitutional symptoms are usually present. One of the principal features of early

bronchogenic tumors is partial or complete bronchial obstruction producing wheezing, baying type of cough and dyspnea. In carcinoma, pain and dyspnea are more prominent symptoms than in tuberculosis. Dyspnea is not distressing in tuberculosis except in the advanced stages. Tuberculosis, moreover, is a disease of youth but 80 per cent of carcinomata of the lung occurs after forty years of age.

The x-ray is of great value in diagnosis. While both tuberculosis and carcinoma show a predilection for the upper lobes, carcinoma usually spares the apices and originates in the hilus. Partial or complete atelectasis of an area without lesions suspicious of tuberculosis elsewhere in the lung is suggestive of carcinoma. Such areas, in fact, are usually the first x-ray evidence of tumor, and are due to obstruction of the bronchus of this area. Sometimes a peripheral zone of emphysema may be seen.

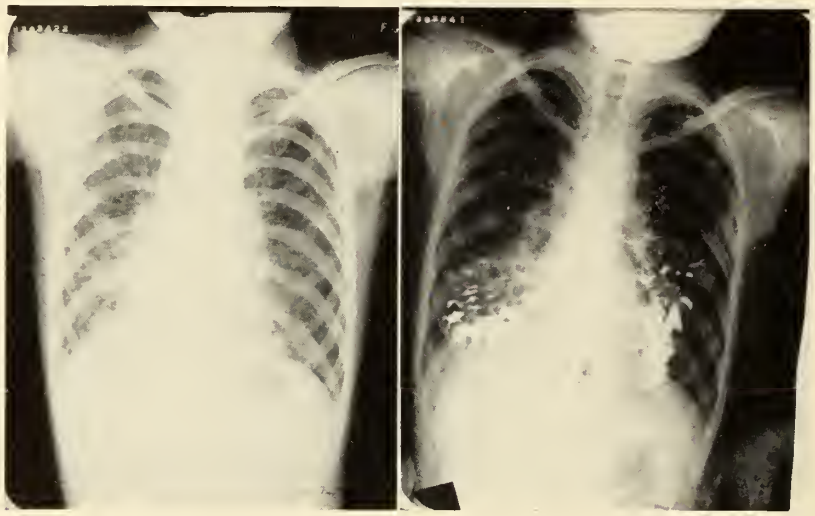


Fig. 6. (a) Flat radiograph of a patient with bilateral bronchiectasis. (b) Film after lipiodol injection.

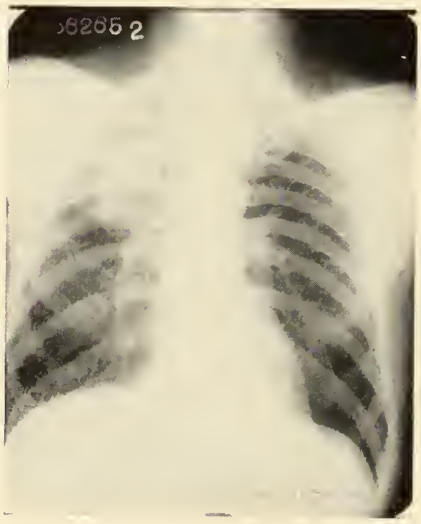


Fig. 7. Radiograph taken one year before death showing an atelectatic area in the right upper lobe with a surrounding area of emphysema. The right apex is apparently clear.

In making a diagnosis the sputum findings are of great importance. Bronchography may be useful in demonstrating the location and extent of bronchial occlusion. Sometimes the tumor may be outlined by the contrast medium. Bronchiectasis may develop in the portion of the lung distal to the point of obstruction. Likewise effusion may appear.

Bronchoscopy may make the diagnosis if the tumor can be reached and a biopsy obtained. Sometimes artificial pneumothorax is resorted to in order to displace the lung and thus bring the upper lobe bronchus within reach of the bronchoscope. The differential diagnosis then may be summed up as follows: History, sputum studies, x-ray appearance, bronchography, and bronchoscopy.

Without attempting to discuss them here, mention should be made of several other chest conditions which can cause confusion in diagnosis. Such are congenital cysts of the lung, ecchinococcus cysts, the mycotic group, actinomycosis, blastomycosis, and also sarcomatous tumors.

Chronic passive congestion and postoperative atelectasis may also occasion difficulty in certain

cases, although a careful history, physical examination and x-ray studies will usually identify them.

Figure 7 is a roentgenogram of a man sixty-

chogenic carcinoma was made. He was given deep x-ray therapy.

Figure 8-A is a film of a woman originally diagnosed as miliary tuberculosis, and shows nod-

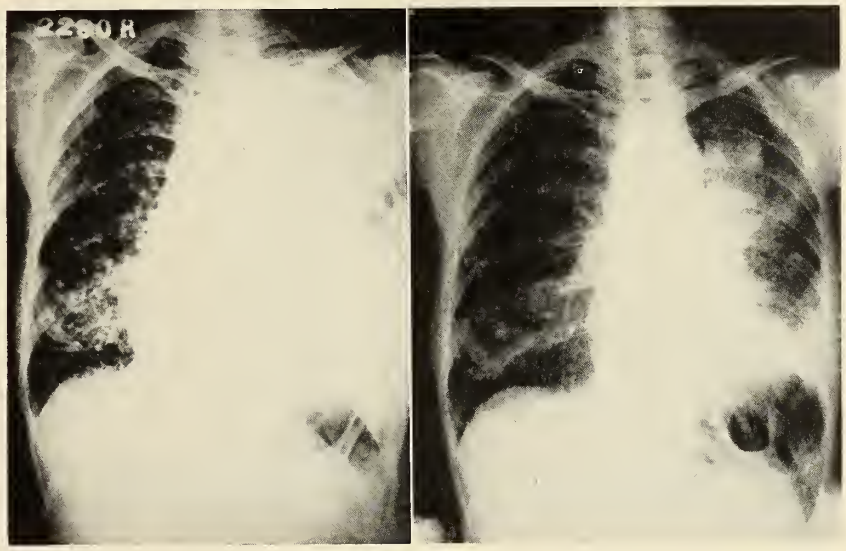


Fig. 8. (a) Left bronchogenic carcinoma followed by miliary type of metastasis in right lung. (b) Following aspiration of fluid from left pleural cavity.

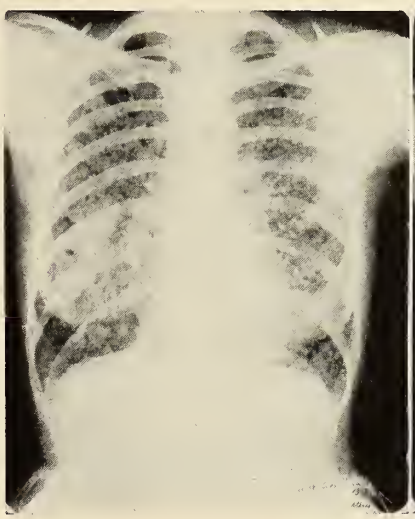


Fig. 9. Discrete mottling of uniform distribution of both lungs without cavity formation.

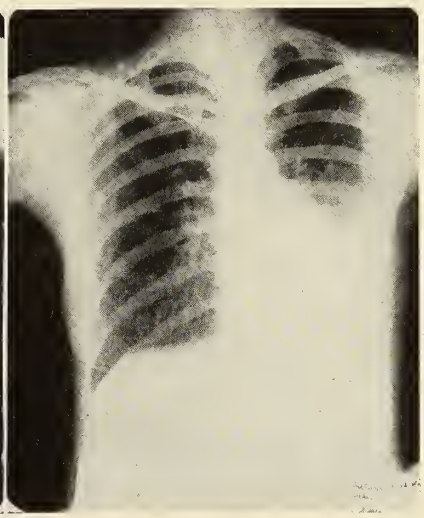


Fig. 10. Atelectasis of lower left lung field caused by benign bronchial tumor.

one, well until a few months previous to examination. He had had an influenzal attack, followed by cough, expectoration, and moderate hemoptysis. Several sputum specimens were negative for tubercle bacilli. Bronchoscopic examination was done, but the upper lobe bronchus could not be visualized. This man was sent to the University Hospital and a diagnosis of bron-

ular areas of density in the right lung, and a pleural effusion on the left side. The densities, while evenly distributed, are larger than the type seen in miliary tuberculosis. In addition, the patient had no fever, no dyspnea, and was not toxic.

Figure 8-b was taken following aspiration of the fluid on the left and introduction of a small

amount of air. The detail of the left lung is now clear and shows densities similar to those on the right. In addition, an area of atelectasis is seen in the left lower lobe, indicative of obstruction of the bronchus. Bronchoscopy revealed a tumor in the left lower lobe bronchus. Diagnosis: Bronchogenic carcinoma with generalized metastases throughout both lungs.

Figure 9 is a roentgenogram of a woman with a history of dyspnea and expectoration for two months prior to the taking of the film. The Mantoux test, several sputum specimens and one culture were negative. She had had a gynecologic operation (hysterectomy ?) some years before.

Partial autopsy showed carcinoma cells and filling of alveoli with a mucinous secretion, believed to be metastatic from the ovary.

Figure 10 is a roentgenogram of a young girl with a history of cough and dyspnea. X-ray shows atelectasis of the lower left lung field, the other areas being clear. Bronchoscopy demonstrated a small pedunculated tumor obstructing the left lower lobe bronchus. This was excised and the atelectatic area later re-expanded. The patient was still living and well two years later.

Figure 11a is the roentgenogram of a man of forty taken before he came to the sanatorium. He had had an acute illness three years before, diagnosed pneumonia. On admission, however, he had no cough, fever, nor night sweats. Sputum examinations were negative at all times. Blood specimens repeated several times were reported 4+ Kline and Kolmer. He was observed at the Minnesota State Sanatorium over a period of fifteen months during which time he received intensive antiluetic therapy. At the end of this time his lungs had cleared on x-ray examination as shown (Fig. 11-b). We believe a presumptive diagnosis of luetic pulmonary involvement is justified in this case.

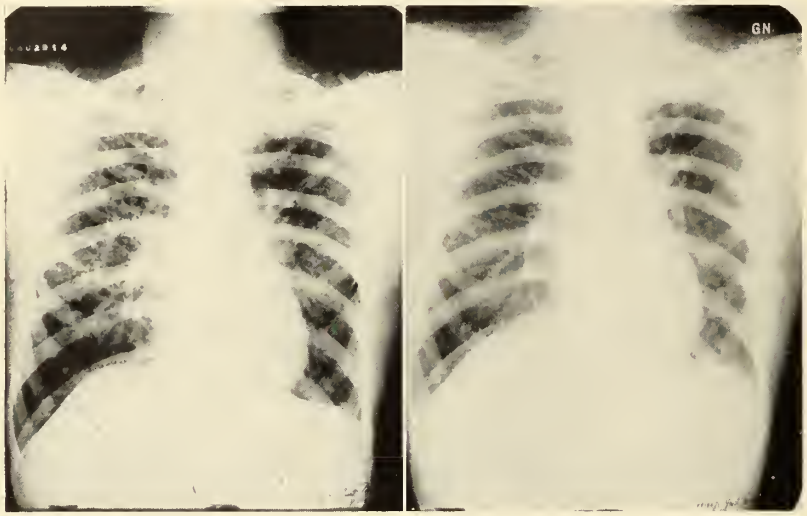


Fig. 11. (a) Diffuse increase in lung design in a patient with positive blood Wassermann. (b) Same patient following luetic treatment.

Bibliography

1. Cole, Lewis Gregory, and Cole, William Gregory: Pneumoconiosis (Silicosis). pp. 21-40. New York: John B. Pierce Foundation, 1940.
2. Elsom, K. A., and Ingelfinger, F. J.: Eosinophilia and pneumonitis in chronic brucellosis; a report of two cases. Ann. Int. Med., 16:995, 1942.
3. Kinsella, T. J.: Personal communication (bronchiectasis); slide (carcinoma of the lung).
4. Kissin, M., and Cohen, A. G.: Large healed tuberculous focus (probably primary) simulating metastatic carcinoma of the lung. Ann. Int. Med., 14:1216, 1941.
5. Minnesota State Sanatorium: Case records and radiographs.
6. Rigler, Leo G.: Outline of Roentgen Diagnosis. p. 81. Philadelphia: J. B. Lippincott Company, 1938.

THE TUBERCULOUS WORKER IN WAR INDUSTRIES

The successfully treated part-time or full-time tuberculous worker can contribute to the manning of the war industries with great benefit to the nation and to the worker himself. A risk is present, but if workers are chosen on a sound medical basis, the risk is not great and is worth taking particularly in the present emergency. Plans must be made also for the future tuberculous service men and civilian war workers. The expansion of the facilities for training and placement of tuberculous workers is necessary. The establishment of workshops for industrial convalescence and perhaps colonies for chronic patients is called for.—Louis E. Siltzbach, M.D., *Milbank Memorial Fund Quarterly*, January, 1943.

NATURALLY ACQUIRED TUBERCULOSIS IN HETEROLOGIC HOSTS

WILLIAM H. FELDMAN, D.V.M., M.S.
Rochester, Minnesota

WITH certain reservations tuberculosis may be said to be a ubiquitous disease. Not only is it practically worldwide in its geographic distribution, but of great interest is the occurrence of the disease in a wide variety of species. Natural occurrence of the disease in most of the warm-blooded mammals and fowls and in such cold-blooded animals as alligators, iguanas, turtles, frogs, fish and snakes makes it evident that few if any species of animals have an absolute resistance to the disease. Individual resistance or susceptibility to tuberculous infections varies within wide limits and this fact should be taken into consideration before one draws conclusions as to whether a given species is susceptible to infection with one or more of the several bacterial types of the causative organism.

The Avian Tubercle Bacillus

Tuberculosis of the lower animals is of importance for several reasons. Few indeed are the bacterial diseases that provide the student of comparative pathology such phylogenetic diversity as tuberculosis. Such studies furnish information that makes the fundamental pathologic characteristics of the disease in all species more understandable. The existence of many different recognizable types of tubercle bacilli and the fact that many lack host specificity and are capable of inducing slight to severe tuberculous disease in heterologous hosts complicate tremendously the problem of tuberculosis control. For example, the natural host of avian tubercle bacilli is the chicken; yet in addition to a marked pathogenicity for other barnyard fowl and many species of wild birds, avian tubercle bacilli are responsible for serious losses in swine. Avian tubercle bacilli also affect sheep and occasionally cattle.

The possibility that avian tubercle bacilli may be pathogenic for human beings has interested many clinicians as well as many laboratorians. The widespread distribution of avian tuberculosis over most of the northern hemisphere, the excessive numbers of bacilli present in the lesions of chickens and the frequent presence of intestinal lesions that discharge large numbers of bacilli that are excreted with the fecal discharges all constitute abundant opportunities for the transmission of the disease to uninfected susceptible hosts. Fortunately, human beings appear to have a high resistance to tubercle bacilli of the avian type and as a consequence few authentic cases of avian tuberculosis infection in human beings are on record. It is true that the literature contains many alleged cases in which the infective agent was stated to be avian tubercle bacilli, but when the reports are scrutinized carefully, acceptable or convincing proof necessary to substantiate a diagnosis of avian tuberculosis infections is lacking in most instances.* In all the literature pertaining to tuberculosis of human beings there are probably less than twenty cases in which it is reasonably certain that the infective agent was the avian tubercle bacillus.

The avian tubercle bacillus also has been considered of etiologic significance in Hodgkin's disease. Although it cannot be said that the problem has been studied exhaustively, the evidence in support of a causative relationship of avian tubercle bacilli and Hodgkin's disease is far from convincing.

The Bovine Tubercle Bacillus

The organism of bovine tuberculosis also may produce disease in swine, dogs and cats. Although most birds are highly resistant to bovine tubercle bacilli, canaries and parrots may be affected. Of great importance, however, is the fact that human beings are susceptible to bovine tubercle bacilli. This well-established fact has been reëmphasized during the past decade by the demonstration in certain European countries, especially England, Scotland and Denmark, of several hundred cases of pulmonary tuberculosis in human beings due to the bovine type of infection. Heretofore the intra-abdominal tissues and the bones and joints were considered the usual situations for infection of human beings with bovine tubercle bacilli, but we must now

From the Division of Experimental Medicine, Mayo Foundation, Rochester, Minnesota.

Read in Symposium on Tuberculosis at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 1, 1942.

*A complete review of the question of avian tuberculosis infections in human beings will be found in my monograph.

recognize that the bovine type of the organism is fully capable of producing the more serious pulmonary form of the disease.

The Human Tubercle Bacillus

The human type of the tubercle bacillus is also capable of producing serious tuberculous disease in heterologous hosts. However, with the exception of parrots, human tubercle bacilli are incapable of producing a progressive, serious infection in birds. Incidentally, parrots appear to be more susceptible to bovine and human tubercle bacilli than to avian tubercle bacilli. Swine also may become infected with human tubercle bacilli. In a series of garbage-fed hogs studied a few years ago I found that 25 per cent of the animals from which tubercle bacilli were obtained were harboring tubercle bacilli of the human type. The public health implications of such findings are obvious. Although the pathogenicity for cattle of human tubercle bacilli is slight, a few cases in which this organism was responsible for tuberculosis in cattle have been reported. Recently material from one such case was studied in my laboratory. The animal was an adult bovine that had been shipped for slaughter from Canada to South Saint Paul, Minnesota. At necropsy sufficient tuberculosis was found to require the condemnation of the carcass. Tubercle bacilli that were proved eventually by animal pathogenicity tests to be of the human type were obtained from the lesions in the lung and one of the bronchial lymph nodes.

A résumé of the evidence available suggests that human tubercle bacilli are rarely responsible for lesions of naturally acquired tuberculosis of cattle. The infrequency of this type of infection and the character and anatomic distribution of the morbid changes make it unlikely that the human type of tuberculous infection in cattle may be transmitted from one animal to another. In other words, once the disease is established in a bovine animal, it usually remains localized and the lesions show a marked tendency to heal or to become quiescent.

There is, however, a phase of the problem that is worthy of brief comment. This is the possibility of cattle becoming sensitized to mammalian tuberculin as a consequence of contact with human tubercle bacilli derived from persons affected with pulmonary tuberculosis. Several workers have investigated this problem and have assembled a sufficient amount of presumptive evidence to substantiate the conclusions that cattle, exposed to infective material from human beings affected with human tubercle bacilli, may become sufficiently sensitized to mammalian tuberculin to elicit a diagnostic reaction to the intracutaneous tuberculin test. The reports reviewed seem to indicate that after the source of the human tubercle bacilli has been removed, the animals gradually lose their sensitivity to tuberculin. It is obvious, therefore, that persons suffering from active pulmonary tuberculosis should be excluded from premises frequented by cattle—not especially because the disease may be transmitted to the cattle but because of the greater possibility of sensitizing the animals to tuberculin that may be used in subsequent diagnostic tests.

The question of whether a cow harboring human tubercle bacilli as a consequence of natural exposure will eliminate tubercle bacilli with the milk has been studied rather comprehensively by Hinderson and by Nielsen and Plum and the results failed to reveal a single instance in which this occurred.

The human type of the organism also affects dogs and a large number of such cases have been recorded. Since in the majority of cases the lungs are affected it is evident that the tuberculous dog may well become a menace to the health of human beings and especially to children who frequently fondle their canine pets. Dogs are also susceptible to infection with bovine tubercle bacilli, although most of the cases of tuberculosis of dogs that have been reported have been due to the human type of the organism. This is not because dogs are less resistant to human tubercle bacilli than to the bovine type of the organism. The explanation is that there exist more opportunities for exposure to the human type of the bacillus. Of some interest to the pathologist is the fact that the morbid changes in tuberculosis of dogs are without giant cells of the Langhans type and that calcification rarely occurs. Dogs have a formidable resistance to avian tubercle bacilli; only one authenticated case is on record.

But few cases of tuberculosis in cats have been recorded. Unlike the dog, the cat is not equally susceptible to human and bovine types of tubercle bacilli; of the fifty-six cases reviewed recently by Lovell and White all except four were of the bovine type. The evidence necessary to identify the causative agent positively in the four cases

which were listed as of the human type was inadequate in some instances. The rarity of tuberculosis in the cat due to human tubercle bacilli seems to be established.

Comment

From this brief résumé the wide diversity of tuberculous disease is evident. The ability of all three types of tubercle bacilli responsible for tuberculosis in warm-blooded animals to infect, frequently seriously, heterologous hosts should be recognized more generally. If this fact is fully understood and its importance amply appreciated, the necessity of a comprehensive plan of control and eradication of tuberculosis becomes evident. To eliminate the tuberculosis in one species and ignore the disease in others is not likely to solve the larger problem. Ideally our goal should be the elimination of tuberculosis from all species. Until this is done it is possible for the disease to exist in heterologous hosts in which the presence of tubercle bacilli constitutes a potential source of new infections, perhaps in natural hosts.

Notable progress has been and is being made in subduing the disease in all the natural hosts except the chicken. We have in our possession the necessary knowledge literally to eradicate human, bovine and avian tuberculosis. However, to accomplish the task will require aggressive and noncompromising action. Gains made must be vigilantly guarded and constantly expanded. An attitude of complacency or one in which past achievements are given precedence over the importance of the task yet to be done will defeat any plans of attack, no matter how adequate they may be. The tubercle bacillus ranks high as an enemy of man and of the lower animals and should be dealt with accordingly. It can never be subdued and made a decent member of society by the terms of any armistice. Attack rather than defense should be our watchword.

References

1. Feldman, W. H.: Avian Tuberculosis Infections. P. 357. Baltimore: Williams & Wilkins, 1938.
2. Feldman, W. H., and Moses, Harold: Human tuberculosis in a bovine. Case report of a spontaneous infection in an adult bovine. Am. Rev. Tuberc., 43:418-424, (March) 1941.
3. Hinderson, R.: Förekomsten av Tuberkelbakterier av human typ hos nötkreatur. Finsk Veterinartidskrift, 39:154, 1933.
4. Lovell, R., and White, E. G.: Naturally occurring tuberculosis in dogs and some other species of animals. Brit. Jour. Tuberc., 34:117-133, (July-Oct.) 1940; 35:28-40, (Jan.) 1941.
5. Nielson, F. W., and Plum, N.: Tuberculin reactions in cattle due to infection with the human type of the tubercle bacillus. Skandinav. Vet. Tidskr., 30:245, 1940.

DIAGNOSIS OF EARLY TUBERCULOSIS AMONG UNIVERSITY STUDENTS

RUTH E. BOYNTON, M.D.

Minneapolis, Minnesota

THE early diagnosis of tuberculosis in any group will be achieved only when some program is adopted in which it is possible to make a diagnosis before the disease has developed to a stage where symptoms are present. This ideal can be reached in the population at large when two things are accomplished: (1) when the public has been educated to the point where they will go to their doctors annually for periodic health examinations; and (2) when every physician will include a tuberculin test and x-ray examination of all reactors as a part of such a periodic examination. It undoubtedly will take many years before the Utopia just suggested will arrive. The practicality of such a program in the early detection of tuberculosis, however, has been amply proven in tuberculosis case-finding programs which have been carried out among all age groups in many localities.

In our colleges and universities an ideal opportunity exists to diagnose tuberculosis in its presymptomatic state. Medical examinations required at entrance to the university and subsequent periodic health examinations during the four years in college afford an unusual opportunity to find tuberculosis in an age group in which the disease is known to be prevalent.

At the University of Minnesota over a period of over twenty years a program has been carried out in which we have endeavored to detect the presence of tuberculosis before it has reached a symptom-producing stage. On entering the University every student is given a complete physical examination. This examination includes the

From the Students' Health Service, University of Minnesota, Minneapolis, Minnesota. Read in the Symposium on Tuberculosis before the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 1, 1942.

TABLE I. MANTOUX TUBERCULIN TEST

	Men		Women	
	No.	Per Cent	No.	Per Cent
Total Number of Cases	2760		1900	
Positive before entrance	204	7.4	197	10.4
Positive 1–1000	280	10.1	166	8.7
Positive 1–100	286	10.4	199	10.5
Total Positive	770	27.9	572	29.6
Total Negative	1990	72.1	1328	70.4
Negative 1–1000	2276		1537	
But Positive 1–100	286	12.6	199	12.9

TABLE II. RE-INFECTION TYPE OF TUBERCULOSIS 1940-41

	Men	Women	Total
Cases diagnosed clinically active	10	5	15
Cases diagnosed clinically inactive	9	12	21
Cases in which activity undetermined	7	2	9
Total new cases found	26	19	45
Cases previously diagnosed—back in college 1940-41	16	14	30
Total cases under observation	42	33	75

Mantoux tuberculin test and a chest x-ray of all who react to tuberculin. That early tuberculosis will be missed unless the medical examination includes tuberculin testing and a chest x-ray of reactors is evident to anyone who has examined large groups of people. In our institution a study which was made of re-infection type of tuberculosis found in University students over a five-year period showed that only 10 per cent of the minimal cases had physical signs suggestive of disease on examination of the chest, and only 24 per cent of the moderately advanced cases. Had we been depending on the physical examination of the chest alone, over three-fourths of the cases of active re-infection type of tuberculosis would have been missed.

In the year 1940-41 over 4,600 University students were given a complete medical examination at the time of entering the University. For the tuberculin test Koch's old tuberculin was used in two doses. The initial dose contained one-tenth of a milligram of old tuberculin; and the second dose, given to all who were negative to the first test, one milligram of old tuberculin. Twenty-seven and nine-tenths per cent of the men and 29.6 per cent of the women students reacted to tuberculin. Slightly over one-fourth of the students entering the University then are potential cases of clinical tuberculosis at the time they come to school.

The importance of using the two-dose method of tuberculin testing is shown by the fact that approximately 13 per cent of those students who were negative to one-tenth of a milligram of old tuberculin showed a positive reaction when the test with the one-milligram dose was used.

While only a small proportion of students reacting to tuberculin are found to have any evidence of infection in the lungs by x-ray examination, it should always be kept in mind that a person who has a positive tuberculin test undoubtedly has a focus somewhere in the body, and the fact that the chest x-ray is negative should not lull one into a false sense of security that such an individual needs no further observation. Our experience has shown that not infrequently tuberculosis in some part of the body other than the lungs may appear at a later date. It is our practice to refer all tuberculin-positive students to our tuberculosis clinic, which has been under the direction of Dr. J. A. Myers for more than twenty years, where they may be kept under observation throughout their residence in the University.

In the same year of 1940-41 through the routine medical examination of students, either on entrance or at the time of a subsequent periodic examination of students who had been in school, forty-five cases of re-infection type of tuberculosis were found. Of this forty-five, fifteen or one-third were diagnosed as clinically active cases, twenty-one as clinically inactive, and there were nine cases in which the activity was undetermined. During the same year there were thirty cases of previously diagnosed re-infection type of tuberculosis who were back in college, making a total of seventy-five cases under observation during this one school year.

TABLE III. INCIDENCE OF RE-INFECTION TUBERCULOSIS

	Men	No. per 1,000	Women	No. per 1,000	Total	No. per 1,000
Total registration 5-year period	43,037		26,658		69,675	
Total cases of re-infection tuberculosis	56	1.3	70	2.62	126	1.8
Arrested	11	0.25	20	0.75	31	0.44
Minimal	34	0.79	38	1.42	72	1.0
Moderately advanced	10	0.23	11	0.41	21	0.3
Far advanced	1	0.023	1	0.037	2	0.028

its early stage possible, is shown in Table III. This presents the cases of re-infection type of tuberculosis found in University of Minnesota students over a five-year period. Of ninety-five cases of active tuberculosis during this period, seventy-two were classified as minimal, twenty-one as moderately advanced, and only two as far advanced. Since we know that only 10 per cent of the minimal cases were found to have abnormal chest findings on physical examination alone, it is obvious that without the routine use of the tuberculin test and the chest film over sixty of these cases of minimal tuberculosis would have been missed.

Evidence that the periodic health examination and not the office visit or examination when hospitalized is the most productive time to detect tuberculosis in its early stages is presented in Table IV. At the University of Minnesota over a five-year period there were 126 new cases of tuberculosis diagnosed. Of these, 56.4 per cent were found at the time of the routine entrance examination and 32.5 per cent at the time of the routine periodic health examination. In other words, 89 per cent of the cases of re-infection type of tuberculosis found in students during this period were found as a result of a routine health examination and not because the students were seeking medical aid because of symptoms.

TABLE IV. RE-INFECTION TUBERCULOSIS

First Discovered In:	Arrested		Minimal		Moderately Advanced		Far Advanced		All Types	
	Total	%	Total	%	Total	%	Total	%	Total	%
Entrance examination	18	58	42	58.4	9	42.9	2	100	71	56.4
Periodic health examination	13	42	19	26.4	9	42.9			41	32.5
Dispensary			7	9.7	3	14.2			10	7.9
Infirmary			4	5.5					4	3.2
Total	31	100	72	100.0	21	100.0	2	100	126	100.0

In the clinical cases found to be active the University feels its responsibility is to aid these students in obtaining proper treatment by referring them home to their private physicians. Those cases of inactive tuberculosis are kept under very close observation in the Health Service. They must report regularly for examinations, must have the gastric contents examined to determine whether tubercle bacilli are present, must have frequent x-ray examinations of the chest so that we may be assured that individuals with active tuberculosis are not living in the University community. Likewise those in whom at the time of the initial examination the activity of the disease cannot be determined are studied frequently and carefully until assurance can be given that active disease does not exist.

That routine physical examinations including specific diagnostic measures for the detection of tuberculosis will make diagnosis of the disease in

The following case histories will illustrate some of the points which I have made. (Lantern slides were presented.)

Case 1.—This case is that of a young man who entered the University of Minnesota in 1931. At his entrance examination he was negative to one-tenth of a milligram of old tuberculin but showed a reaction to

the one-milligram dose. An x-ray of the chest taken at that time was reported as negative. Reëxamination of this radiograph later showed that there apparently was a shadow in the left lung near the periphery about the level of the fifth interspace anteriorly which proved to be a primary tuberculous focus in the pneumonic stage. Because of his positive tuberculin reaction, this student had chest x-rays annually for a period of eight years. He entered the Medical School and thus was under observation for this length of time. Until 1935 there was little change in the appearance of the chest. The radiograph taken in 1937 showed definite evidence of calcification at the site of the previous shadow and in the left hilus region, which was interpreted as a Ghon's tubercle, and some calcification of the mediastinal glands. This is a case in which the reaction to the first infection with tuberculosis was seen very early, in which by periodic chest examination it was possible to watch the process go on to calcification and the development of the characteristic Ghon tubercle and calcification of the hilar glands.

Case 2.—This case illustrates the importance of considering a positive tuberculin reaction as important regardless of whether the chest shows any evidence of infection in that locality. This is an older student, a woman forty years of age, who entered the University in the fall of 1939. She gave a history of having had a positive tuberculin reaction before entering the University. An x-ray of her chest showed calcium deposits in the right hilus region but no other evidence of disease in the lungs. The history revealed, however, that she had had extensive tuberculosis of the pelvic organs with a tuberculous peritonitis two years previously for which she had had surgical treatment elsewhere. A report from the clinic where she was treated confirmed this diagnosis.

Case 3.—This case is that of a Negro girl who entered the University in September of 1939 as a senior. She was twenty-two years old. In the history she stated that a grandmother had had tuberculosis, but gave no history of contact. She was a reactor to tuberculin at the time of her examination, and the routine chest x-ray was taken. This radiograph made on November 29, 1939, was clear except for evidence of a small calcium deposit in the right lung at the level of the fourth interspace anteriorly. She was referred to our chest clinic and was advised to have another radiograph of the chest made in one year.

In February, 1940, three months after the first radiograph, the patient developed what apparently was a mild upper respiratory infection. This persisted for ten days with an elevation of temperature which did not exceed 99.6 degrees during this period but with a persistent cough. The physical examination of the chest was essentially negative. However, because she was living in a rooming-house and this so-called "cold" had persisted, she was admitted to the students' infirmary. A radiograph made of the chest on March 2, 1940, the day of admission, showed evidence of disease in the left lung which proved to be a tuberculous pneumonia. Tubercle bacilli were present in the sputum on several examinations. This student was sent to her home state for sanatorium care.

Case 4.—This case is that of a student who entered the University in the fall of 1939, and who reacted to tuberculin with one-tenth of a milligram of old tuberculin. He gave a history of having been exposed to tuberculosis, his father having died of the disease, and his mother having had an infection. The routine film made on October 24, 1939, showed no evidence of disease. Because of the history of immediate family exposure, this student was advised to have another film made in six months. This was done and the radiograph made in May of 1940 again showed no evidence of pathology. On returning to school the next fall another radiograph of the chest was requested and made on November 13, 1940, just six months after the last radiograph. This time there was definite evidence of a process undoubtedly tuberculous which was present in the right apex and extended down to the second rib. Several small areas of increased density were thought to represent small cavities. A review of the film of May, 1940, showed some increased density in the right apex which could easily have been and was misinterpreted for a soft tissue shadow. Undoubtedly this represented the early tuberculous process at that time. This case illustrates exceptionally well, I believe, the importance of repeated periodic examinations of the positive tuberculin reactor, even though the initial radiograph shows no evidence of pathology, and particularly when there is a definite known history of intimate exposure.

Case 5.—This case is that of a student eighteen years old who entered the University in September, 1939. He reacted to one-tenth of a milligram of tuberculin at the time of this examination. A radiograph of the chest taken on November 4, 1939, showed no evidence of pathology. Another radiograph taken in November, 1940, also showed no evidence of disease. In January, 1941, the student reported to the Health Service complaining of a pain in the right side of the chest which had been present for forty-eight hours. He had had a mild upper respiratory infection for a few days but had had no cough or fever. The physical examination of the chest at that time revealed no evidence of friction rub nor râles. He was fluoroscoped and a shadow was present in the right apex, and a film of the chest was ordered. This radiograph showed an infiltrating process extending from the apex down to the fifth rib anteriorly on the right side with a cavity under the clavicle at the end of the first rib and also a cavity at the end of the fourth rib anteriorly. The left lung was negative. Tubercle bacilli were present in the sputum. This again is a case in which the student had had a negative radiograph two months prior to the diagnosis of a rather extensive tuberculous process and emphasizes again the importance of keeping under careful observation the positive reactors.

Case 6.—This case is that of a student who entered the School of Nursing in 1930 at which time she reacted

positively to one-tenth of a milligram of old tuberculin. An x-ray of the chest was negative. During the time that she was in the School of Nursing she had annual radiographs made of the chest which until 1934 showed no evidence of any disease. The routine radiograph made in October, 1935, showed evidence of a tuberculous process with cavity formation in the left lung. She was having no symptoms at the time this radiograph was made.

Evidence has been presented to show the importance of keeping under observation the reactors to tuberculin whether the chest radiograph shows evidence of disease or not. In some cases the tuberculous process may be elsewhere in the body and may be missed unless one keeps in mind this possibility.

Our experience with a tuberculosis case-finding program at the University of Minnesota, as illustrated by the cases presented, has made us firmly believe that if tuberculosis is to be found in its early stages, a specific effort must be made to detect the disease. In our opinion one of the most effective means of doing this is through the periodic health examination which must include the tuberculin test and the x-ray reactors. Eighty-nine per cent of the cases diagnosed among University students were found as the result of such routine examinations.

HOW A COUNTY CAN BE ACCREDITED FOR TUBERCULOSIS CONTROL

S. A. SLATER, M.D.
Superintendent and Medical Director Southwestern Minnesota Sanatorium
Worthington, Minnesota

TWO outstanding undertakings sponsored by the Minnesota State Medical Association have been initiated since our last annual meeting. These are the Meeker County demonstration for the control and eradication of tuberculosis and the plan for accrediting counties meeting certain requirements in the control of tuberculosis. Dr. Danielson has told you of the Meeker County demonstration, and I will attempt to explain how a county can be accredited and what it means. These two undertakings have caused more interest, not only in this state, but in others, in tuberculosis control, than anything I can recall in the past twenty years. I am glad the State Medical Society is primarily responsible for both of these undertakings. It shows that the medical profession is deeply interested in the fight against tuberculosis. This unusual interest will do much to insure its success. Again Minnesota is the leader in the fight against tuberculosis. In 1910 the death rate was 110 per hundred thousand; by 1940 it had fallen to 27.7 per hundred thousand. In a few counties of the state over a five-year period it had fallen to an average of less than 10 per hundred thousand. The results are most encouraging but the fight has not been won and we must not lessen our effort until victory is complete. Even the counties with the extremely low death rates will experience an early rise if they do not continue on the job, looking for the enemy and attacking as soon as discovered.

The requirements for a county to become eligible for accreditation is to have an average death rate over the previous five years of less than 10 per hundred thousand. At least 75 per cent of the graduating high school class of the county must be tested with 0.1 mg. of old tuberculin or the equivalent with not more than 15 per cent reacting positively to the test. There are only four counties in the state at the present time showing a death rate of less than 10 per hundred thousand. There are quite a number of counties with a death rate of from 10 to 15 per hundred thousand, and others ranging from this figure to a high of 68 per hundred thousand in one county. With an average death rate for the state at present of 27.2 per hundred thousand, and an increased effort and interest on the part of every physician, the entire state should be accredited in a few years. Lincoln County with a death rate of 5.5 per hundred thousand for the five years previous to 1941 was the first county in the world to become accredited for the control of human tuberculosis. This county received its certificate of accreditation December 11, 1941. Olmsted County was second and received its certificate May 22, 1942.

Read in the Symposium on Tuberculosis at the annual meeting of the Minnesota State Medical Association, Duluth, Minn., July 1, 1942.

Murray County will be the third and will receive its certificate some time this fall. If the death rate continues to fall in Minnesota, several counties of the state should be accredited each year. Will this be accomplished? The answer lies with the physicians of the state. A successful fight against tuberculosis depends more on the interest of the general practitioner than any other single factor. Experience has shown that when the physicians are actively interested in the fight against tuberculosis, that county shows a proportionately low death rate. Since some of the counties are now becoming accredited, other counties are asking the question, how can they do likewise? There are many things entering into a successful fight against tuberculosis. It is largely a coöperative effort and every means possible at our command should be used. The physician has to be aroused and the public has to be educated. Both must realize that most cases of tuberculosis are well advanced before symptoms appear sufficient to cause a patient to consult a physician. The only way to find the early case is to look for it. When everyone realizes this and acts accordingly much will be accomplished. Every means possible should be exerted to find all open cases of tuberculosis as early as possible. When found they should be removed immediately to an institution where they will have the best chance to recover and the public will be protected. The family and contacts of open cases of tuberculosis should be examined to discover individuals with early tuberculosis, while they have a good chance to recover and before they have endangered others. All school boards should require the teachers and other employes of the school to present medical proof that they are free of tuberculosis. It has been shown that a single teacher who was an open case of tuberculosis infected at least 80 per cent of her pupils. An active tuberculin testing campaign of the school children is of considerable value. Probably the best results can be obtained by testing the first-year pupils and the seniors each year rather than testing all pupils infrequently. Such a program keeps the interest in tuberculosis control alive and yet limits the number of individuals tested so that adequate follow-up work can be done on the contacts of those reacting to the test. The value of testing the first-year pupils is helpful in finding the source of infection since the positives were most likely infected in the home. Testing the seniors serves to uncover clinical tuberculosis in the individual or prove freedom of tuberculosis upon graduating. With a diligent search being continually made to find the cure of tuberculosis as early as possible and see that the proper treatment is instituted at once both to give the patient the best chance to recover and protect the public much will have been accomplished. The county making such a whole-out effort will see the death rate falling and may soon be in a position to become accredited.

The State Medical Association and the State Board of Health decide when a county has met the necessary requirements for accreditation. The certificate is given by the two organizations. In addition to the proper endorsement by both of these organizations the certificate bears the Seal of the State and signature of the Governor, and is presented to the county board of the county meeting the necessary requirements. This is an event any county can take pride in and every county can strive to achieve. It will stimulate greater interest in the fight against tuberculosis than anything previously undertaken in the state.

The death rate from tuberculosis has risen following every great war. It is the hope that the increased effort stimulated in this state will spread to others and thus prevent history from repeating itself, and that we shall see the death rate continue to fall. Other states are watching Minnesota in this undertaking. It is the hope of the State Medical Association that every physician will help make it a success, thus establishing Minnesota as a leader in a new undertaking for the control and eradication of tuberculosis.

PANIC IS FEARED

Panic is feared even more than poison gas by those charged with the defense of the civil population against possible chemical attacks, Prof. Chauncey D. Leake of the University of Texas stated. People do not know about war gases, and they are afraid of them; but "Tell the people the truth about war gases and they will probably respect them more and fear them less," he said.

Some fumes that arise in certain types of fires may be mistaken for poison gases spread by the enemy, Prof. Leake pointed out, and this can give rise to reports of chemical attacks that have not actually taken place.—*Science News Letter,* April 24, 1943.

CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL

A. J. Hertzog, M.D., and S. V. Lofsness, M.D.
Pathologists

Presentation of a Case
Case A-42-2150

Dr. Hertzog: A forty-nine-year-old white female was admitted to the fracture service of the hospital and expired twenty-six hours after admission as a result of a crushing injury of the chest and fractures of the pelvis and right leg. She had been picked up by the ambulance after apparently having been struck by an automobile. An unexpected finding at autopsy was a marked atrophy of the left cerebral hemisphere. It was our opinion that this gross lesion represented a congenital anomaly. The brain was examined by Dr. A. B. Baker and Dr. Harold Noran of the Department of Neurology of the University of Minnesota. Dr. Baker and Dr. Noran were kind enough to come over today and present their findings.

Dr. Noran: I have been able to obtain some additional history. As the only informant was a younger sister, the history of the patient's early years is not entirely complete. The sister stated that the patient, at 10 days of age, became extremely ill and developed a right-sided hemiplegia. The condition was regarded as brain fever. Even though the hemiplegia persisted, she gradually became able to walk for long distances but only partially regained the use of her upper extremity which was always held in a fixed position. She forced herself to use her afflicted arm a great deal without any apparent improvement in its strength. She started school at the age of eight years. However, after reaching the second grade, her parents were informed that she was subnormal and not capable of continuing in school. She was tutored at home for several years, but this was later discontinued because of her slow progress. She learned to read and write, but her ability along these lines was less than that of a seven-year-old child. Her chief activity consisted in helping with some of the less complicated household duties. She was never able to handle any form of responsibility. Throughout her life she remained at a childish level, continuing to play with dolls. She also revealed emotional instability manifested by temper tantrums. Early in life she developed epileptiform seizures which occurred at about monthly intervals. The seizures were characterized by spasm of the entire body, loss of consciousness, and foaming at the mouth. They were often prolonged and inhalations of chloroform were often required to stop the seizures. The convulsions ceased abruptly at the age of twenty-five years. Between the ages of thirty and forty, three apoplectiform seizures appeared. These consisted of a sudden loss of consciousness which lasted for about twenty-four hours and were followed by generalized weakness of about one week's duration. There were no neurological residuals following any of these attacks. At about this time the left eye required enucleation because of a severe inflammatory lesion. During the last few years of her life, she gradually lost her memory so that she failed to recall where she had placed certain familiar articles. Nevertheless, her memory as regards certain dates and events was not impaired. More than one question at a time would often confuse her. During all this time there was no notable change in her hemiplegia. As Dr. Hertzog said, the immediate cause of her death was an accidental injury, and we are only reporting the finding in the nervous system.

External examination of the brain, as shown by this lantern slide, shows that the left cerebral hemisphere is much smaller than the right. The frontal lobe is markedly atrophic and has lost most of its normal architecture. A lateral view of the brain shows, in addition, an almost complete absence of the temporal lobe which has been converted into a thin membrane. The adjacent portions of the parietal and occipital lobes are also somewhat atrophic. Sections through the brain show a marked destruction of the left frontal lobe by numerous large and small cystic areas. The thin band of tissue remaining in these areas is firm and fibrous. There is marked dilatation of the anterior horn of the lateral ventricle which appears secondary to the tissue destruction. The temporal lobe is represented merely by a thin membrane of tissue.

Microscopic sections of both frontal and temporal lobes are similar, as they show almost complete destruction of the cortex. The inner layers of the cortex are replaced by this cystic degenerative process. There is a complete devastation of nerve cells associated with a considerable glial proliferation. We can see on this slide numerous small globules of calcification resulting from a deposition of calcium salts within small hyaline blood vessels. Throughout the white matter there are extensive diffuse areas of demyelinization, as well as focal areas of demyelinization, with beginning cavitation. Glial nodules are also seen scattered throughout areas of the brain that appear grossly normal. Scattered throughout both cerebral hemispheres are perivascular accumulations of lymphocytes. These perivascular infiltrations are also seen in the basal ganglia and brain stem. In addition, a few scattered foci of polymorphonuclear neutrophiles are observed. A marked proliferation of the lining endothelium of many of the small blood vessels is also found.

Discussion

Dr. Noran: The lesions in this case are so similar to those of a proven case of the western variety of chronic equine encephalitis, that we feel we are justified in concluding that it is also a case of chronic equine encephalitis, even in the absence of neutralizing virus studies. We believe the primary lesion is a widespread involvement of the blood vessels that leads to extensive areas of demyelinization and cystic degeneration. As the history in this case goes back to infancy, it shows that the virus may remain active for long periods.

Dr. Lofsness: Do you mean that these anatomical lesions would allow you to differentiate equine encephalomyelitis from the St. Louis variety?

Dr. Noran: In our opinion the lesions in both the acute and chronic cases of equine encephalitis are sufficiently characteristic to allow one to make a specific diagnosis. The striking features in this case are the extensive demyelinization, cavitation, and vascular calcification. These findings do not occur in other types of encephalitis. In the acute cases of equine encephalitis that we have studied, we found many vessels that showed marked proliferation of the vascular endothelium and some of the larger vessels were occluded by suppurative and nonsuppurative thrombi. We feel that if these patients had survived the acute phase of their illness, extensive areas of tissue destruction would no doubt have followed. Some youngsters, after recovery from equine encephalitis, show epileptiform seizures. Encephalographic studies in some of these cases with convulsions have shown a gradual enlargement of the ventricles. There have been cases reported, such as this case, under the title of congenital aplasia of the brain. However, there is no proof that the process was present at birth, and I have the conviction that these cases represent unrecognized cases of equine encephalitis.

Student: Do you think that the pathological processes are going on in these brains for years?

Dr. Baker: I think that what happens is that the equine virus does not disappear from the cells of the nervous system after the patient recovers from the actue stage. If the virus had disappeared from the body, then the patient would recover completely. In spite of the fact that the acute stage is over, the virus caused endothelial proliferation, and by producing calcification within the vessels leads to gradual atrophy and infarction of the brain tissue. Hence, I have the feeling that the virus of equine encephalitis may remain active for many years after a patient apparently recovers from the disease from a clinical standpoint.

Student: Do electro-encephalograms help you in a study of this disease?

Dr. Noran: You would no doubt obtain changes in the electro-encephalogram, but I do not believe they would be of any help from a diagnostic standpoint.

Dr. Arthur: Were the changes in the brain in this case localized?

Dr. Noran: They were most marked in the frontal and temporal lobes, but there was a diffuse involvement of the entire brain.

Dr. Baker: The largest epidemic of equine encephalitis in the United States was in this district. There were approximately 700 cases. We will probably continue to have equine encephalitis in Minnesota and the Northwest until we learn how the disease is spread. We will have to be a little cautious in the prognosis, as even after clinical recovery we cannot guarantee that there will not be a recurrence of the disease. In those patients that recover, they may still show small areas of focal damage. This is not enough to produce symptoms, but if the patient lives long enough they may cause trouble.

Interne: Do you think that equine encephalitis is a new disease?

Dr. Baker: I think that we saw cases of it, but it was not recognized. It has, however, shown an increase in both horses and men.

Dr. Hertzog: The immediate cause of death in this case was a crushing injury to the chest and fractures of the pelvis and right leg. In view of the history of hemiplegia beginning at the age of ten days, ones first impression would be that the cerebral findings were on a congenital basis. Dr. Noran and Dr. Baker have shown us why they consider this case to be chronic equine encephalitis. I want to thank them for coming over today.

WASTE FAT SAVING

Physicians are urged by the Waste Fat Saving Committee, with headquarters in New York City, to set an example in the saving of fat in their households. Waste household fat should be saved and returned to the meat stores which are prepared to pay the prevailing price for kitchen fats or to accept them as gifts to the war effort. This saved fat is turned in to the renderers to make up the 200,000,000 pounds desired for 1943.

The glycerine derived from fats is desperately needed to feed the United Nations' war machine. It is the source of nitroglycerine and dynamite, is used in paint, as an anti-icing fluid for the propellers of airplanes, on shock-absorbers of jeeps, the recoil mechanisms of big guns and the firing mechanisms of depth bombs.

Glycerine is also widely used in medicine. More than three pounds of glycerine per hospital bed are used in our hospitals. With the sole exception of water it is the most used liquid in medicines.

It is said that every pound of waste cooking fats will provide enough glycerine to make a half pound of dynamite or four 37-mm anti-aircraft shells.

Fat saving, though bothersome, is one of the important activities which will play a part in the successful prosecution of the war.

HISTORY OF MEDICINE IN DODGE COUNTY

BY JAMES ECKMAN
Rochester, Minnesota

and

CHARLES E. BIGELOW, M.D.
Dodge Center, Minnesota

(Continued from April issue)

The year 1869 in Dodge County medicine was enlivened by professional bickering so fierce that the editor of the *Dodge County Republican* of Kasson thought it necessary to admonish certain physicians in his newspaper. It seemed that a physician in Mantorville had prepared a paper on the cause and treatment of pulmonary tuberculosis. This paper had been published in the *Mantorville Express.* Another Mantorville physician, in a succeeding issue of the *Mantorville Express,* had attacked the first physician "with the ferocity of an angry bull-dog, which seems to us," declared the *Dodge County Republican,*[33] "is neither professional, courteous, or gentlemanly deductions. . . . Such wrangling is unworthy the profession; and we advise the learned doctors to act the part of gentlemen at least. It is bad enough for the community to swallow their nostrums, without being compelled to swallow such a sickening dose of spleen and 'bad blood,' and the *Express* is made the funnel through which this sickening dose is administered to the public."

Probably there were other professional feuds and encounters, also; but as a rule such difficulties are not perpetuated in print. It may be said, parenthetically, that both men involved in the aforementioned disagreement were entirely competent physicans of excellent standing.

The Minnesota State Medical Society was reorganized in 1869, and someone in Dodge County reported to the society at its first semi-annual meeting at Owatonna on June 16, 1869, that there were four regular practitioners of medicine and two irregular physicians in the county that year.[42]

The first physician in Dodge County to become a member of this society was elected to membership at the aforementioned session at Owatonna. He was **Dr. O. W. Sadler** of Concord, and he seems to have ranged about Southern Minnesota rather widely in the sixties and seventies. He had come from the East (presumably from Pennsylvania, like Doctor Potter), and is known to have been in active practice in Concord in 1870. On the other hand, in a directory of the city of Wabasha contained in a history[43] of Wabasha County printed in 1870, Doctor Sadler was listed as having an office on Washington Street in Wabasha. Perhaps he maintained an office in Concord and another one in Wabasha. Again, he may have practiced in Winona.*

*In various sections of Minnesota the practice of a physician's maintaining an office in several villages is still existent. In some cases in which a single village cannot support a full-time resident physician, this procedure affords the only means of providing medical care for the villagers concerned. Itinerant quacks as a rule, particularly in the early days, did not maintain offices in the towns which they visited periodically; rather, they used hotel facilities and carried their equipment with them.

It was reported[44] that in 1870 Doctor Sadler had taken part in a consultation with Doctor Garver and Doctor Willson in a case involving insanity, and it is known that in 1871 he tendered a bill for $54.00 to the commissioners of Dodge County for medical services rendered to the destitute of the county.[45] It would be desirable to learn more about this frontier physician who was the first in his county to affiliate himself with the newly reorganized state medical society, but efforts of the authors thus far have not been particularly successful in such a quest. A few data have come to hand. For instance, Doctor Sadler's name is printed in the list of members of the Minnesota State Medical Society in the society's *Transactions* for a number of years, and in each list he was indicated as residing in Concord. His name is to be found in the list of members in the *Transactions* of 1875, but not in the *Transactions* of 1876. It is probable that by the last-named year he had already left the state. It is believed that he went to Pittsburgh. He styled himself an "eminent oculist"[46] and in July of 1875 made it known[47] that he was operating for "crossed eyes" at the Bradley House in Mantorville, while he was back in Minnesota for a visit. He visited Mantorville again in 1879 with his wife, and then "returned to Philadelphia [*sic*]."[48] In the summer of 1890 it was recorded[49] that Mrs. Sadler and her child, "from Pittsburgh, Pa.," were visiting in Mantorville. She was the former Emma Josephine Slocum of Mantorville, whom Doctor Sadler had married at some time in the late sixties or early seventies.[50]

The Return of Adversity, 1870-1880

It is possible to reproduce something approximating the vital statistics of Dodge County for the year 1870, since a history[5] of the county issued in that year contained what were said to be excerpts from the census, probably not official. There were 8,686 people in the county, of whom 4,592 were males. Of these, only 1,900 were American citizens eligible to vote.* There were 4,094 females, which would indicate, numerically at least, that females desirous of acquiring husbands should not have been at too great a disadvantage, since as stated there were 4,592 males. There were 1,599 families, members of which occupied 1,557 dwelling houses.

Deaths were distributed according to the following causes:

Pulmonary tuberculosis	8	Dropsy	2
Drowning	3	Childbirth	1
Measles	4	Epilepsy	1
Typhoid fever	2	Inflammation	1
Congestion of brain	2	Diphtheria	1
Old age	2	Disease of kidneys	1
Puerperal fever	1	Softening of brain	1
Chronic diarrhea	1	Whooping cough	3
Cancer	1	Gangrene of wound	1
Killed by lightning	4	Unknown	9

The seventies in Minnesota, and particularly in the southern rural counties, are remembered for the years of the locusts and the panic of 1873. In June of 1873 a tremendous torrent of locusts inundated the Western Minnesota farmlands, coming from Dakota and afflicting at least thirteen southwestern counties in Minnesota.[51] So voracious were they that the yield of wheat on lands which they visited was reduced to less than six bushels an acre.[51] Entire families of

*Readers doubtless will recall that the nineteenth amendment to the Constitution—"The right of citizens of the United States to vote shall not be denied or abridged by the United States or by any State on account of sex"—did not become effective until August 26, 1920.

settlers were left penniless, many of them with the added catastrophe of an unsatisfied mortgage.* The locusts returned in 1874, 1875, 1876 and 1877. Nevertheless, bumper crops were produced in Dodge County in 1877, to judge by contemporaneous newspaper reports.

It is not generally realized that the locusts ranged as far to the east as Dodge County, but newspapers of the county mentioned the pests frequently, particularly in 1873 and 1874. In 1877 a dual menace afflicted Dodge County—"chinch-bugs and tramps"—and in 1878 the affliction, although somewhat different from that of 1877, was again double—"hard times and diphtheria."

Railroad building had come to a standstill in the fall of 1872, and during the next year the panic of 1873 descended upon the people. Prices for agricultural products of all kinds declined fearfully, but in general the cost of transporting these products from the farmlands to the metropolitan markets remained comparatively high. Moreover, a cycle of national deflation was in motion, and it was not to be completed for several years to come.

Yet, panic, locusts or lack of inland transportation did not deter physicians from locating in Dodge County from 1870 to 1880.

In June of 1870 it was announced[52] that **Doctor Stephen W. Ranson** (1843-1904) had hung out his sign in Dodge Center. Doctor Ranson was to remain in this town until his death. He had been born in Michigan, as will be shown, but had been reared in Dodge County, and had returned to the county to practice medicine after his graduation from the Chicago Medical College in 1870.

Another physician who settled in Dodge County in 1870 was **Doctor James Manning Saunders** (1816-1904). He came from Milton, Wisconsin, to locate in Dodge Center in October of 1870, although at that time he did not have the degree of Doctor of Medicine. Like Doctor Ranson, Doctor Saunders remained in Dodge Center for the rest of his life. He was graduated from the Hahnemann Medical College and Hospital of Chicago in 1871, and was one of the founders of the Southern Minnesota Homeopathic Medical Society at Owatonna in October of 1871, as has been shown elsewhere.[53]

In the summer of 1871 the *Dodge County Republican*[54] of Kasson observed that Minnesota air, "as usual" was very clear, that there was very little illness, and that "our M.D.s have little to do."

Two physicians are known to have settled in Dodge County in 1873. **Doctor Christopher Porter Gibson** (1848-1933), who had been brought to the county in 1856 with his parents, was graduated from the Chicago Medical College in the spring of 1873 and returned at once to Dodge County, where he located in Dodge Center. He remained at Dodge Center until 1881, when he moved first to Fairpoint in Goodhue County and then to Concord in Dodge County. He went to Redwood Falls in 1889 and practiced there until 1912.

"Dr. Horace Porter called at our sanctum this morning," the editor[55] of the *Dodge County Republican* of Kasson observed in December of 1873. "We learn that he is considering locating somewhere on this line of railway. His large civil and military experience will recommend him to any community."

This was **Doctor Horace P. Porter** (1838-1912), a graduate of the Medical Institution of Yale College who had come to Dodge County from Western Michigan. He decided to locate in Kasson, but remained there for slightly less than a year, going to Claremont in September of 1874.[56] At Claremont in December

*For an especially vivid account of the ravages of the locusts in one Southern Minnesota county, and of methods adopted to combat them, see: Moro, A. R.: The English Colony at Fairmont. Minnesota History, 8:140-149, (June) 1927.

of 1874* Dr. Porter began to issue a curiously flamboyant four-page newspaper called *The Wind Mill,* "issued when we feel like it" and "circulation immense." It was printed at Kasson and distributed at his own expense. The salutatory editorial in this odd publication follows:

In accordance with a time honored custom, the embryonic, or, to speak more "korrectly," the new born publisher is expected to apologise for—for—for what? Well, for being born "anyhow." But we can't do it. It is of no use. The tremendous rush of advertising not only abridges our space for editorial strategy, but absolutely crowds out our home and foreign correspondence. A host of choice and racy sketches from all the larger cities of Europe and America will be utterly lost to the anxious readers of this issue of our paper. We wanted to say something. We are pregnant with ideas, and the strain on our editorial safety valve is immense. Several cash advertisers are waiting for space in our second number, and we shall have to endure the suspense. None but those similarly situated can appreciate our heart-rendering situation. It is obvious to every one that this is a four-page paper. We have never measured its periphery, consequently we can't give its dimensions. But that is not necessary. "Shaver" will do that. Shaver is a man of inches. He has had his editorial measuring rod into about every newspaper in the country. He will deliniate with mathematical exactness our precise length and breadth, including area and solid contents. But we are not in a fault-finding mood. Shaver is a good fellow, with

Just enough of naughtiness
To give him an appearance
Of editorial jauntiness.

He is as fine a craft—sitting low, rakish and handsome on the editorial waters—as ever spread its literary sheets to the breeze of public opinion. We have had him after us before, and can speak authoritatively of his soiling qualities.[57]

The "Shaver" referred to in this editorial was Ulysses Bishop Shaver (1827-1898), an Ohioan who founded the *Dodge County Republican* at Kasson in 1867.[58] What Doctor Porter meant by "We had had him after us before" can only be surmised.

In the same issue of this little four-page unpaginated sheet Doctor Porter observed that "The plague is on the decline. No new case to report, and the sick are all mending.[57]

Numerous references to the status of the public health in Claremont were printed in *The Wind Mill.* In the issue for December of 1875 Doctor Porter observed that:

We still have an abiding faith in the future prosperity of this little hamlet. The chronic sores so wittingly referred to by the genial editor of *The Kasson Republican* are all healed, and the scars are fast disappearing. A healthy nutrition pervades the entire system of our village economy, and we are destined to come a "town." . . . Please stand up for Claremont, gentlemen, and lean heavily upon anybody who persists in the exhibition of a dog-in-the-manger spirit.[59]

In the issue[60] for May of 1876 he said:

We need a public well located in some accessible place on the high ground south of Front Street. There are but few wells of really wholesome water in town.

Later in the year he said that:

The Western part of Dodge County is, at the present time, in the full enjoyment of almost universal immunity from disease. If the grasshopper stays away ten years, real estate will quadruple in value, perhaps in less time. A few years of patient industry and careful economy will make this country the garden of the Northwest.[61]

In the same issue he declared that "A stove-pipe hat, a gold watch and a profound look of 'almightyism' don't make a man a Doctor in this country or any other."[61] It would be hard to determine against whom this shaft was directed, for it may have been intended for some transient quack who happened

*"Dr. Potter is very busy," the *Dodge County Republican* observed in a Concord news note in the issue of December 21, 1874. It is thought that this was Dr. J. M. Potter, an eclectic physician, but this is not certain. He may have been in Concord from 1871 to 1875. Mrs. Mary Wheeler of Concord recalled that Dr. Potter of Concord attended her sister when the latter died in Concord on December 21, 1874.

to be in Claremont at the time, or for some physician not resident in Claremont.

"Just now we are being deluged with veterinary surgeons," Doctor Porter reported in this issue[61] (December, 1876), "All of them experienced men, and by the way the field is ample. We never saw so many cropped horses before."

He also presented a short description[61] of Claremont as he saw it in December of 1876:

> We told you two years ago that Claremont was destined to prosper. Since the first number of this paper was issued the population of the village has about doubled. Real property has appreciated about 100 per cent., and still they come, and new buildings continue to go up. We now have two stores carrying general stock, one hardware and one drug store, a good hotel, three blacksmiths, a harness maker, wagon maker, and a first-class shoe-maker; a millinery establishment, two first-class lumber yards, a furniture establishment on the way, the best wind-power flouring mill in the State, a doctor [Porter] of 16 years military and civil experience, a real estate and insurance office, the best elevator of the line of the Winona & St. Peter R. R., two grain buyers, a good school presided over by the tallest and best school teacher in the State, religious services by an eminent divine at regular intervals; and all things considered we ought to be satisfied with the progress we have made. And we would say to our farmer friends in view of the short crops and hard times, don't you think you had better stay by your own commercial center, your town, and spend your money in a sphere wherein a portion of it at least will not be wholly beyond your reach?

Reference to a physician outside Dodge County who was already well known in Southern Minnesota was made by the *Dodge County Republican*[62] of Kasson in 1873. This newspaper reprinted a short news item from the *Rochester Record* in which it was said that **Dr. William W. Mayo** (1819-1911) was planning to move to Saint Paul in association with **Dr. Charles Hill** (1826-1914) of Pine Island. "He has been here for ten years," the *Rochester Record* observed of Doctor Mayo. A picture of Doctor Hill owned by the Minnesota State Medical Association shows him to be a lean, angular man with a formal, square-cut coat which reached to his knees and a tall hat such as was worn generally in the forties and fifties. He was an old friend* of Doctor Mayo, but the two men never made the removal to Saint Paul mentioned in the *Rochester Record.*

The year 1874 was marked by the death of **Dr. Josiah R. Dartt** of Mantorville. The funeral ceremonies were witnessed by one of the largest crowds ever to assemble in Dodge County.

In 1874 a work called *An Illustrated Historical Atlas of the State of Minnesota* was published by A. T. Andras of Chicago, and was printed by a house which has since become world famous for fine printing and publishing—R. R. Donnelley and Sons Company, operating the Lakeside Press of Chicago.[63] This ornate atlas was issued under the sponsorship of a list of "patrons." Among the "patrons" in Dodge County were Doctor Bedient, Doctor Garver, Doctor Ranson, Doctor Saunders and Doctor Porter.[64]

Dr. Nils Schultz Holterman (1845-1895) came from Saint Louis, Missouri, at some time in 1874 to settle in Kasson. He was a Norwegian physician who had intended to settle in Chicago, and had reached that city from Norway just before the great holocaust of 1871. He remained in Kasson until 1878.

"Thirty years later, when Doctor Hill was seventy-seven years old, he was elected first vice president of the Minnesota State Medical Association. Asked for a speech, he replied (in part): "Near me is a great hospital that was scarcely known fifteen years ago, that has now a national and, I might say, an international reputation, and it is presided over and is the work of young men. The Mayos are geniuses. I live within fifteen miles of Rochester and a good many people go there that might otherwise come to me, but I have no feeling in the matter. I have nothing against such men; I am proud to know them, and I am glad to live near them."—Transactions of the Minnesota State Medical Association, Thirty-Fifth Annual Meeting, held at Saint Paul, Minnesota, June 17, 1903, Chicago, Press of American Medical Association, 1904, pp. 24-25.

In May of 1874 **Dr. John J. Everhard** moved from Mantorville to Kasson.[65]

Dr. H. B. Young came to Kasson in July of 1875, to remain there for about a year. In May of 1876 he departed with his wife for New York, there to sail to Europe for further study in medicine. It is believed that Doctor Young settled in the East when he returned from Europe, but nothing more is known about him.*

In October of 1875 **Dr. Henry T. Turner** (1837-1913), an eclectic physician, settled in Kasson, where he stayed until about 1889, save for a short interval which he spent in Minneapolis. Eventually he served as health officer of Kasson.

In December of 1875 Doctor Garver moved from Wasioja to Dodge Center, and about a month later he announced a partnership in Dodge Center with Dr. Christopher Porter Gibson[66] (1848-1933).

Dr. Curran W. Higgins (1849-1926), who had been reared in Dodge County, schooled in homeopathic medicine by **Dr. William Huntington Leonard** (1825-1907) of Minneapolis, and graduated from the Hahnemann Medical College and Hospital of Chicago in 1876, came to Concord for a very short while in 1876. Woods[13] said that Doctor Higgins never practiced medicine in Concord, but Moreland[67] said he did. Doctor Higgins soon went to Corning, Iowa, and from that town to Brookings, Territory of Dakota. His career will be recounted later.

In 1877 newspapers reported a new fad in Dodge County: the use of blue glass in windows of many homes in the county.† The belief was that the sun's rays, filtered through such glass, would cure chronic conditions if persons so affected would sit in the transmuted rays for indefinite periods. Some of these windows are still to be seen in some of the older houses.

Oliver H. Phillips (1834-1905), editor of the *Dodge Center Press,* remarked in his newspaper on April 19, 1877, that "Doctor Steere did some work on our masticating apparatus . . ." In the same issue the professional card of this man appeared:

W. B. STEERE, M.D.
Resident Dentist
Teeth extracted without pain.
Prices low and work warranted.
DODGE CENTER, MINN.

Doctor Steere was not a dentist by training. He had been graduated from the old Eclectic Medical College of Philadelphia on January 22, 1862, and probably had come to Minnesota from DeWitt, Iowa. He remained in Dodge Center until 1881, in which year he removed to Pierre, Territory of Dakota, as will be shown. He was never licensed to practice medicine in Minnesota.[40]

*But a Dr. Arthur B. Young located in Winona in July of 1876. In March of 1884 he was living in Prescott, Wisconsin. The authors do not know whether or not he was the same Doctor Young mentioned above. See reference 213.

†This fad was not confined to Dodge County, by any means. For instance, in 1871 General Augustus J. Pleasanton issued his *On the Influence of the Blue Color of the Sky in Developing Animal and Vegetable Life* (Philadelphia, 1871), and in 1877 appeared his *Influence of the Blue Ray of the Sunlight and of the Blue Colour of the Sky, in Developing Animal and Vegetable Life, in Arresting Disease, etc.* (Philadelphia, 1877), printed throughout on blue paper.

(To be continued in the June issue)

President's Letter

"The failure to coördinate knowledge and action is all too common in our efforts to control and eradicate tuberculosis."

(Quotation from *Tuberculosis Abstracts* by the National Tuberculosis Association)

THERE is an inherent inertia in the make-up of human beings, a tendency toward laissez faire, sometimes called conservatism, which impedes the acceptance of any new idea, and delays the utilization of any new knowledge. It is doubtless true that "knowledge is power," but power is only an attribute or property of the possessor of it which merely makes it possible for him to do or effect something. In every field of human endeavor we find failure to coördinate knowledge and action, or, more accurately, to translate knowledge into action. "There is nothing new under the sun" and old knowledge which has long lain dormant and useless for want of action, is continually being dug up.

The years 1882 and 1895, in which, respectively, the germ of tuberculosis and the x-ray were discovered, mark the beginnings of the acquisition of the knowledge on which the control of tuberculosis is based. Thirty years later, the control of this disease, even in cattle, still seemed to many veterinarians to present obstacles which were impossible to overcome. The program of testing of herds of cattle progressed but slowly and in spite of much opposition, Minneapolis has the distinction of being the first city in the United States to require that no dairy products be sold within its limits unless they came from cattle which had been tested with tuberculin. The idea of "area testing," or testing of all herds in a county was first tried in the early 1920's. The State of Minnesota was one of the leaders in adopting the program of "area testing" and by December 1, 1925 four counties in Minnesota had become "Accredited Areas." By 1935 every county was accredited.

The success of the area testing program in the control of bovine tuberculosis inspired the Committee on Tuberculosis of our Association to work out plans for a similar program with respect to human tuberculosis, and Minnesota has the distinction of leading the nation in the application of this plan.

Two of the four counties above mentioned are entitled to especial distinction. Murray County was the fourth county in the State to be Accredited for Bovine Tuberculosis Control in 1925, and was the third county in the State to qualify for Accreditation for Human Tuberculosis Control. Meeker County was the third county of the State to be accredited for Bovine Tuberculosis Control in 1925. Besides this, it has inaugurated a unique plan for the control of human tuberculosis. The Meeker County Plan has attracted nation-wide interest and has received financial support from the American Medical Association from the Minnesota State Medical Association and from philanthropic individuals.

Our Association may feel justifiable pride in the work of its Committee and members in thus placing Minnesota among the leading states in the Union in the control of tuberculosis. The accusation of failure to coördinate knowledge and action cannot be sustained against Minnesota.

Stephen A. Baxter

President, Minnesota State Medical Association

Editorial

Carl B. Drake, M.D., *Editor;* George Earl, M.D., Henry L. Ulrich, M.D., *Associate Editors*

STATE MEETING

THE ninetieth annual meeting of the Minnesota State Medical Association will be held May 17, 18 and 19 at Minneapolis. The complete program appears in this issue.

With national medical meetings suspended for the duration, emphasis has been placed on the importance of local and sectional meetings which require less travel. Meetings of state associations fall into this category.

The program includes some subjects relating to war medicine. As a whole it should prove of value to the general practitioner. One of the two sections will be taken up largely by scientific cinema. Of practical value will be the Round Table discussions scheduled for the luncheon periods Tuesday and Wednesday.

Owing to illness, Dr. Ralph S. Bromer of Bryn Mawr, will be unable to deliver the Russell D. Carman Memorial Lecture. The lecture will be delivered by Dr. Edward L. Jenkinson, Associate Professor of Radiology, at Northwestern University Medical School. The other guest speakers will be Dr. Frank C. Neff, Professor of Pediatrics at the University of Kansas School of Medicine and Captain E. G. Hakansson of the United States Navy who will speak on "Tropical Diseases."

One of the outstanding features of the meeting will be the address by the Honorable Walter H. Judd, congressman at Washington from the Fifth District, who will speak at the banquet Tuesday evening on his experiences in Washington.

Various phases of the child problem during wartime will occupy Wednesday afternoon. Public health nurses, social welfare workers, members of parent-teacher associations and all others especially interested in child health are invited to attend.

The business side of the meeting will be largely completed on Sunday preceding the convention. This will enable delegates and officers to take advantage of the scientific program.

Members, although busier than usual this year, would do well to make every effort to take advantage of the stimulus which will doubtless again be afforded by our State Meeting.

PROPAMIDINE

ATTENTION was called in a recent editorial[1] in the *Journal of the American Medical Association* to a new drug which apparently represents a distinct advance in preventing, but more particularly in removing, infection from streptococci and Staphylococcus aureus in burns and wounds.

Four reports[2,3,4,5] of experience with propamidine (4:4 diamidinodiphenoxy propane dihydrochloride) recently appeared in *Lancet* which are convincing as to the value of this new drug.

The local action of sulfonamides seems to be inhibited by the peptones and other constituents of pus and tissue fluids; not so with propamidine. Used in a 0.1 per cent strength in a watery gel of 5 per cent methyl cellulose, Thrower and Valentine,[5] found that acute and chronic infected wounds were freed from streptococci and in most instances staphylococcic infection in two to ten days. Wounds are cleansed with sterile saline solution and the gel is applied directly with vaseline strips placed over the wound. The dressing is renewed in forty-eight hours and the treatment is limited to ten days. There is some danger of skin irritation from action of the vehicle rather than the propamidine if it contacts the skin, and prolonged use beyond the ten-day period is not recommended.

Some of the authors mentioned used propamidine in 0.1 per cent strength in a Mumford base (lanette wax and paraffin) and found that the addition of 1 per cent stovaine rendered this preparation particularly suitable in the treatment of painful burns. The use of the preparation in recent burns prevents infection and hastens repair.

Propamidine will doubtless become available

and wider experience should substantiate the experience so far reported.

References

1. Editorial: Propamidine in chronic wound infection. Jour. A.M.A., 121:946, (Mar. 20) 1943.
2. Kohn, F., Hall, M. H., and Cross, Clara D.: Propamidine at an E. M. S. hospital. Lancet, 1:140, (Jan. 30) 1943.
3. McIndoe, A. H., and Tilley, A. R.: Propamidine in chronic streptococcal infection of raw surfaces. Lancet, 1:136 (Jan. 30) 1943.
4. Morley, George H., and Bentley, J. P.: Propamidine in burns. Lancet, 1:138, (Jan. 30) 1943.
5. Thrower, W. R., and Valentine, F. C. O.: Propamidine in chronic wound sepsis. Lancet, 1:133, (Jan. 30) 1943.

SPANISH AND PORTUGUESE IN MEDICAL SCHOOLS

WORLD War II has without doubt led to a fuller realization in our own country, but to a greater extent in the countries of South America, of the fact that North and South America have certain common interests. It is to be hoped that following the war this more friendly feeling will increase and that the suspicion with which we were regarded in certain South American countries and which was fostered by certain European propaganda will disappear. The two continents are natural rivals in world markets for agricultural products, but this should not prevent a friendly feeling and coöperation between the countries concerned.

Doubtless one reason for lack of understanding between the peoples of South America and those of Canada and the United States is that they do not speak the same language. Spanish is the language of all the South American countries except Brazil. This means that half the people of South America speak Spanish and the other half Portuguese. English is taught in the schools much as German and French are taught here, which means that most of those who have studied English do not read or speak it readily. The presence of more Englishmen in Argentina doubtless accounts for English being taught more in that country. The American movie has been more of a stimulus to the understanding of English than any other factor. Most of the talkies are in English with Spanish or Portuguese captions interspersed. These are more popular than the few which are produced in Spanish or Portuguese for South American consumption.

Science, particularly the science of medicine, should have no international boundaries. One and two generations ago a knowledge of German was considered essential for the well-trained American physician. With the rapid progress of scientific medicine in America the knowledge of German has not been so essential. Hitler's regime has temporarily interfered with Germany's medical progress, although we should not forget that the value of sulfa compounds was discovered in the late thirties in Germany. It is not beyond the realm of possibility that German medicine will regain a position of importance following the war.

German medical literature has had the leading position in medicine in South America. This source of supply is now completely shut off. American medicine has been of less importance in South America than perhaps it should. Regulations have made it well nigh impossible for an American physician to practice in South America. This state of affairs, however, has not existed as far as the American dentist is concerned. There, as well as in Europe and the rest of the world, the American-trained dentist has had a well-deserved outstanding position.

Efforts have been made to increase and improve our relations with the medical profession of South American countries. American medical organizations have visited their professional brethren in South American countries and have been impressed with the character of the medical work in various quarters. Pan American congresses have been conducted to further understanding and exchange of ideas. In an effort to supply American medical literature sources to South American physicians *America Clinica,* containing abstracts of current medical literature, is printed in Spanish and aims at an extensive distribution.

In an effort to overcome the language difficulty, which interferes with mutual understanding and interchange of scientific knowledge, the American Urological Association at its meeting last June drew up a resolution to the effect that the teaching of Spanish or Portuguese in our medical schools should be required. The resolution further recommends the encouragement of the training of South American students in the medical schools of Canada and the United States. Making the study of Spanish or Portugese mandatory in the already full curriculum of our medical schools seems extreme. Nevertheless, the idea of the desirability of a knowledge of these two languages on the part of our profession should be endorsed.

THE HEART PROGRAM OF THE BUREAU FOR CRIPPLED CHILDREN

The Social Security Act passed in 1935 authorized the appropriation of Federal funds for services for crippled children. These funds are paid to the states after annual State plans for such services have been approved by the Chief of the Children's Bureau of the United States Department of Labor.

The child with rheumatic fever or heart disease may be included in the definition of a crippled child.

Minnesota's plan for the care of these children was approved by the Minnesota State Medical Association in December, 1941, and approved by the Children's Bureau in February, 1942. It is administered by the Bureau for Crippled Children of the Medical Unit of the Division of Social Welfare. Children under the age of twenty-one with heart disease or conditions leading to heart disease are eligible for care.

The child must reside in the limited area which is served, but legal residence is not required. This area includes Scott, Dakota, Carver, McLeod, rural Ramsey, and rural Hennepin Counties. Minneapolis and Saint Paul residents are not accepted. The area had to be limited because of lack of funds, and because the Children's Bureau has advised the State agencies to start the programs in limited areas, and do intensive work in these areas until funds are available to expand the program.

Emphasis is given to the care of children with rheumatic fever or rheumatic heart disease. However, children with other types of heart disease which offer a reasonable expectation of improvement from treatment are also eligible for care.

Diagnostic services are available to all children living in the designated area. Treatment is given only when the family is unable to provide adequate private care. The approval of the family physician must be obtained before the child is referred to the heart clinic.

A clinic is held each Friday morning at the Children's Hospital, Saint Paul, to provide diagnostic services and follow-up care. Hospital care is provided for the children during acute illness, at Children's Hospital, Saint Paul, under the direct supervision of the heart clinician of the Bureau for Crippled Children. Convalescent care is also given at the Children's Hospital under the same supervision as hospital care.

Foster home care is arranged for children who do not require further hospital care, whose homes are not suitable for continued rest, or are too far from the clinic for close medical supervision. Supervision in the child's own home is important because there may be many adjustments necessary in the home situation to meet any personal and environmental difficulties which obstruct treatment and care of the child. Efforts to meet these difficulties are made either by the personnel of the Bureau for Crippled Children or by other local or State agencies, with joint planning by the heart clinician, the medical social worker, the public health nurse, all of the Bureau for Crippled Children.

From February 16, 1942, to February 15, 1943, there were fifty-two hospital admissions of thirty-six hospital patients, and 133 visits were made to the weekly heart clinics by forty-seven clinic patients. Ten cases were in the hospital on February 15, 1943.

Inquiries regarding the heart program of the Minnesota Bureau for Crippled Children should be directed to Medical Services Unit, attention of Dr. Malvin J. Nydahl, Head, Bureau for Crippled Children, Division of Social Welfare, Globe Building, Saint Paul, Minnesota.

BOOTH MEMORIAL HOSPITAL

The Salvation Army Booth Memorial Hospital was opened forty-five years ago in Saint Paul, Minnesota, and has an unbroken record of service during that period. It provides care for the unmarried mother and her child and works out the solution of those problems peculiar to such cases. This care is provided regardless of creed, class, or color. The Salvation Army operates thirty-seven similar Homes in the United States, where over 7,000 girls are cared for yearly. The Saint Paul Booth Memorial Hospital has given care to 4,975 girls during the years of its existence.

A girl may come to the Home when it becomes necessary for her to leave her present surroundings. It is preferred that she come at least six weeks before confinement and remain until given the six weeks medical discharge. Any further residence in the Home will depend on the formulating of a social plan for herself and baby.

There is a fee of $50.00 for three months' care; fifty cents for each additional day, but never to exceed $80.00. If a girl decides to leave before confinement, there will be a charge of $5.00 a week for the time of her residence in the Home. A girl may not "work out" her fee, though she is expected to assist with household tasks.

A girl from outside the State of Minnesota is admitted only with the understanding that she will return to her own State and community taking her baby with her. She cannot in any way be a charge upon the State of Minnesota.

Infants are not adopted from this Home. They are referred to Placement Agencies; this matter is handled by the Bureau of Child Welfare during the nursing period. This Bureau is notified of a girl's admittance to the Home and collaborates with the Home on all future plans for mother and baby.

Medical services are under the direction of Dr. John L. McKelvey, Chief of Obstetrics and Gynecology at University Hospital. The pediatric service comes under the direction of Dr. Irvine McQuarrie, Pediatric Chief at University Hospital. The Home has complete hospital facilities, registered nurses, social worker, and a staff of trained workers.

Major Venus McAlearney is Superintendent of the hospital, which is located at 1471 Como Avenue West, Saint Paul, Minnesota.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

NEW PATTERN IN MEDICAL SERVICE

In much of the writing about the need for methods of payment for medical services, certain inevitable processes which are likely to have a tremendous effect upon the pattern of medical service are largely overlooked. One of these is the growth of medical service in industry. While discussion has been continuing over traditional battle grounds, it is just possible that a new movement is growing up all around them that will satisfy the demands of both. This movement is an increasing growth of medicine to meet the demands of industry and the war.

Full-time medical service in industry is educating physicians, patients and employers, alike, in the worth and practicability of systematic preventive medicine, prompt treatment, effective rehabilitation and close coöperation among all physicians.

The experience may not be forgotten when war industries shrink and workers go back to their old occupations. The same type of service may be asked for and secured by a great many people whose pre-war contacts with medical service were not as satisfactory or as available.

Employers Are Active

It is interesting to note that employers' and manufacturers' associations are becoming more interested in the economic, as well as the social phases, of systematic health and medical services in their plants. They argue that the industrial development of postwar America will be accompanied by a corresponding development of industrial medicine which will have an enormous effect upon practice outside the plants.

The field in general is new; but sound standards are being developed under guidance of the American Medical Association's Council on Industrial Health. They give promise of preserving medical and ethical standards of practice and at the same time of exploring fully vast new possibilities for improvement of the health and well-being of millions of American workers.

Referred to Family Physician

Except in unusual instances where medical care is not otherwise available, the best standard demands that the sick or injured worker be referred promptly to his own physician for all but emergency treatment. The practitioner outside the plant in theory should see his own employed patients oftener and earlier, and with the advantage of complete information from the plant medical service as to working conditions and hazards. It may be to the advantage of all physicians in the community to coöperate with the plant services and to inform themselves exactly of needs and methods used.

The duties of the physician in the plant medical service, as set out in the Council's outline of procedure, cover a wide range of service. Among these services, preventive medicine assumes an important and interesting role. In fact, there is every reason to believe that the war effort, including both the growing medical services in industry and the extensive examination of inductees, will operate together to establish preventive practice on a hitherto undreamed-of basis after the war.

Preventive Medicine in Industry

Preventive medicine in the industrial plant is divided between supervision and safeguarding of working conditions and the routine examinations of employes. These examinations go far beyond the immediate objective of determining physical fitness for the job. Industrial physicians check at intervals on physical condition and morale, advise the worker on his own habits and prospects, supervise rehabilitation and generally keep him as content and healthy as possible. Complete records are kept; but the record is confidential and the relationship between the employe and the physician is one of mutual confidence and cour-

tesy. Success of the service depends, ultimately, upon the coöperation of the employe; and it is continually emphasized that the industrial physician of today must be far removed from that natural enemy of the worker, the "company doctor," of other days.

Departments Improve

The medical department in large industries was formerly housed in some unused, ill-ventilated and unlighted corner of the shop. Depending upon the size of the plant, the medical department is now a specially designed, completely equipped health center with complete examination, laboratory and x-ray facilities.

Medical and surgical service in the plant is properly limited. It does not extend to families of employes or employers and includes mainly emergency treatment and treatment for minor ailments which temporarily interfere with the worker's comfort.

It is roughly estimated that the time required of a physician for any plant medical service is about one hour a week for each 100 employes. Thus a plant hiring 3,000 workers would require 30 hours a week from its physician or virtually a full-time medical officer together with nurses and technical assistants.

It is also interesting to note, in recent reports of manufacturers association members, that important saving in operational expenses are claimed to the credit of medical departments. One of them in a recent report, credited his department with a definite saving of $6,000 a year over and above the expense involved in keeping up a model plant, fully equipped and manned.

STUMBLING BLOCK

One of the stumbling blocks in the road travelled by all medically sponsored prepayment plans is now discovered to be the subscriber income limit in the contracts.

All plans are geared to the needs of the lower income groups. The trouble is that prospective subscribers do not care to be bracketed for medical purposes in a "low income group."

Shop superintendents and employers (through whom medical insurance must be sold if it is to be a success) are unwilling to foster the sale of contracts and benefits which are not available to themselves and to employes above the income limit.

Labor leaders are likewise opposed to income limits and many employers who might otherwise be well disposed toward such plans fear possibility of labor trouble among their employes.

On the other hand, fee schedules for services to subscribers of nearly all plans have been reduced to the minimum expected of patients in lower income categories and physicians cannot afford to extend their services to employers and higher income groups at the group plan fees.

"Over-Income" Plan

To meet this serious objection, most of the plans now in operation have been forced to provide what they have called an "over-income" service by which benefits provided under the group plan are regarded merely as an indemnity or credit toward full payment of medical fees. The difference between the credit allowed through the group plan and the actual fee to be paid by the subscriber is decided by the individual physician in consultation with the subscriber.

This is the procedure now in effect in California, North Carolina, Massachusetts, Michigan and Western New York. In other states, enabling acts have placed definite limitations on prepayment plans.

Cash payment toward the doctor's fee rather than full payment of his services is the usual plan of non-medical sponsored insurance companies.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

J. F. DU BOIS, M.D., Secretary

Minneapolis Woman Pleads Guilty to Criminal Abortion

Re: State of Minnesota vs. Clara Olga Anderson

On March 25, 1943, Clara Olga Anderson, forty years of age, 925 Chicago Avenue, Minneapolis, entered a plea of guilty in the District Court of Hennepin County, to an indictment charging her with the crime of abortion. The defendant was sentenced by the Honorable William A. Anderson, Judge of the District Court, to a term of not to exceed four years in the Women's Reformatory at Shakopee. The sentence was stayed upon the condition that the defendant serve one year in the Women's Detention Home, commonly known as the Minneapolis Women's Workhouse, after which the defendant is to be on probation for three years.

The defendant was arrested on March 18, 1943, at a St. Paul hotel, following the death on March 15, 1943, of a thirty-seven-year-old Minneapolis married woman. The deceased was admitted to Deaconess Hospital at 2:10 P.M. on March 15, critically ill. The case was promptly reported to the Minnesota State Board of

Medical Examiners and an investigation immediately instituted in coöperation with the Women's Bureau of the Minneapolis Police Department. The case was submitted to the Hennepin County grand jury on March 24, 1943, and an indictment returned charging the defendant with the crime of abortion. Ordinarily, the defendant would have been charged with manslaughter in the first degree, but those in charge of the case were of the opinion that additional medical testimony would have to be available before such a charge could be substantiated. The defendant holds no license to practice any form of healing in the State of Minnesota.

Minneapolis Woman Pleads Guilty in Federal Court to Forging Narcotic Prescriptions

Re: United States of America vs. Helen Geneva Rudd

On April 2, 1943, Helen Geneva Rudd, forty-three years of age, 2305 E. 38th Street, Minneapolis, was ordered by the Honorable Gunnar H. Nordbye, Federal Judge, taken to the United States Hospital at Lexington, Kentucky, for treatment for drug addiction. Mrs. Rudd pleaded guilty on March 2, 1943, to four counts of an indictment charging her with forging medical prescriptions for narcotic drugs. Mrs. Rudd was placed on probation for three years, conditioned, however, that she be taken to the Hospital at Lexington, and that she be not released until the medical authorities of that institution pronounce her cured.

Mrs. Rudd was arrested on January 14, 1943, following an investigation by the Federal Bureau of narcotics and the records indicate that her addiction dates back about twenty years. Mrs. Rudd has a previous conviction for a similar offense, having pleaded guilty in 1934, and after being placed on probation for two years, violated her probation and was taken to the Women's Reformatory at Alderson, West Virginia, where she served fourteen months. She was again arrested in Minneapolis in 1938, for violation of the Minnesota Uniform Narcotic Drug Act, but was acquitted by a jury in October of that year in the District Court of Hennepin County. Mrs. Rudd has attempted in the past to obtain morphine from numerous Minneapolis physicians by complaining of pain and manifesting other symptoms in her attempts to convince the various physicians that she was suffering from gallstones and other ailments.

Minneapolis Woman Found Guilty of Fraudulently Obtaining Morphine Prescriptions

Re: State of Minnesota vs. Alva George

On April 21, 1943, Alva George, forty-three years of age, was found guilty by a jury in the District Court of Hennepin County of obtaining morphine prescriptions by fraud. The defendant was sentenced by the Honorable William A. Anderson, Judge of the District Court, to a term of not to exceed two years in the Women's Reformatory at Shakopee. The defendant was arrested on August 11, 1942, following a lengthy investigation by the Federal Bureau of Narcotics. This investigation disclosed that the defendant was obtaining morphine prescriptions simultaneously from seven Minneapolis physicians. At the trial, and prior to sentence being imposed, counsel for the defendant severely criticized the medical profession, claiming that the defendant was given narcotic prescriptions without any reason. Notwithstanding the fact that the defendant concealed from each of the physicians that she was also getting prescriptions from the others, this case again illustrates the absolute necessity of a complete examination and a careful diagnosis. Morphine should be prescribed only as a last resort and every physician should be on guard, at all times, that the patient may not be telling the truth about the symptoms or the procuring of similar medication elsewhere.

In Memoriam

HENRY PORTER JOHNSON

Dr. Henry P. Johnson, a practitioner at Fairmont, Minnesota, since 1899, died March 31, 1943, of arteriosclerosis and terminal pneumonia following several years of ill health.

Dr. Johnson was born on a farm in Winnebago County, Wisconsin, February 3, 1855. In June of that year his family moved to Winona County, Minnesota. He grew up on a farm, attended rural schools and later the Winona High School and the Winona Normal College. After teaching school a couple of terms he entered Rush Medical College, Chicago, where he graduated in 1879. He began practice immediately and was active until about five years ago.

Dr. Johnson practiced first at Hancock, Minnesota, then at Houston, Minnesota, La Crosse, Wisconsin, and Long Prairie, Minnesota. In 1899 he became associated with his brother, Dr. E. B. Johnson, at Fairmont.

Dr. Johnson married Ruth Ann Warner at Houston, Minnesota, in 1888. Mrs. Johnson died April 15, 1930. Two children survive: Mrs. Nina Johnson Wallace of Saint Paul and Dr. Donald W. Johnson, now in service at Camp Lewis, but previously in practice with his father at Fairmont.

Although one of the first in Fairmont to purchase an automobile, Dr. Johnson also kept a team of horses for use when the roads were not as passable as at present. His teams were known and admired all over Martin County.

While known as a typical family doctor of the old school, Dr. Johnson kept abreast with developments in the medical field and in later years maintained a finely equipped office and hospital in a large modern building which he owned. At the time of his celebration of fifty years in active practice, Dr. Johnson had had nearly 3,000 maternity cases.

Dr. Johnson was a member of the Fairmont school board at one time and served as city health officer. He was a Methodist, belonged to various Masonic bodies and to the Fairmont Kiwanis Club. He was a member of the Blue Earth Valley Medical Society and the Minnesota State and American Medical Associations.

CHARLES F. McCOMB

Dr. Charles F. McComb, former St. Louis county coroner and widely-known Duluth physician, died March 3, 1943, at the age of eighty-five.

Dr. McComb had practiced for sixty years, and was elected coroner eight times. Born in Stillwater, he attended the University of Minnesota and Rush Medical College, graduating from the latter in 1879.

He practiced at Rush City, Minnesota, for two and one-half years after his graduation before taking a

polyclinic course in New York City. Following completion of this course in 1883, he went to Duluth.

He was accorded many professional honors during his long medical career and served a number of organizations as an officer. He was a former president of the Minnesota State Medical Association, was twice president and once vice president of the St. Louis County Medical Society, was first president of the Interurban Academy of Medicine, an organization of Duluth and Superior physicians and surgeons, was a member of the state board of health under three governors, and was a member of the advisory commission of the state sanatorium for consumptives and a member of the American Medical Association.

Dr. McComb also was a member of the state militia and saw active service in World War I as a lieutenant commander aboard the battleship *Iowa*.

He was a member of Palestine lodge No. 79, A. F. & A. M., Aad Temple of the Shrine, Scottish Rite, and St. Paul's Episcopal church.

Surviving are his wife, Helen, and a sister, Mrs. Carrie Maunsell, Minneapolis.

JENS L. OHNSTAD

Dr. Jens L. Ohnstad, for forty years a practitioner at McIntosh, Minnesota, died February 23, 1943, at the age of seventy-four.

Dr. Ohnstad was born at DeForest in Dane County, Wisconsin, June 20, 1868. He attended normal school at St. Ansgar, Iowa, where he graduated in 1892. He taught school in South Dakota and in Fillmore County, Minnesota, before studying medicine at the Minneapolis College of Physicians and Surgeons. After receiving his medical degree in 1903 he studied further at the Polyclinic Postgraduate School in Chicago in 1906 and at the Neiswanger School of Electro Therapeutics in Chicago in 1908.

Dr. Ohnstad practiced in Belgrade for four months in 1903 and in Minneapolis from 1907 until 1909. In 1908 he married Mabel Hooverson of Red Wing. She died in 1918. In 1923 he married Gunda Egeland Jensen at Bemidji. Mrs. Ohnstad and two sons survive.

Since 1910 Dr. Ohnstad had operated his own hospital in McIntosh, the present structure having been built in 1918.

Dr. Ohnstad was a member of the Red River Valley County Medical Society, the Minnesota State and American Medical Associations.

MICHAEL C. WELCH

Dr. Michael C. Welch, for many years a prominent Saint Paul physician and surgeon, died Saturday, January 30, 1943, in St. Joseph's Hospital following a long illness.

He was born on May 17, 1871, in Wilton, Wisconsin, the son of John Welch and Nora Bergen Welch, both of whom were born in Ireland.

He graduated from the University of Illinois in June, 1905, and spent two years at the Cook County Hospital as intern and house physician following which he located in Saint Paul. He gave freely of his services as a draft board examiner in World War I, then volunteered for enlistment. He was sent to Camp Grant, then overseas for eighteen months, returning with the rank of captain. He opened offices at 936 Lowry Building, which he maintained until his death.

He lived at 801 Hague Avenue, with a nephew, J. L. Welch. Surviving him are two sisters, Mrs. William Welch and Margaret Welch of Tomah, Wisconsin; a brother, James A. Welch of Saint Paul; two nieces, Mrs. Joseph M. Donahue of Saint Paul and Mrs. Cassie Reed of Joplin, Mo.; and another nephew, Ralph Welch of Van Nuys, California.

Dr. Welch was a member of the staff of St. Joseph's Hospital, a third degree member of the Knights of Columbus and a member of the Saint Paul Athletic Club, Town and Country Club, and Catholic Order of Foresters.

He possessed a quiet, retiring disposition, regarded the practice of his profession as a very serious calling and placed his services to the community above any and all other interests.

C. G. Perry

MICHAEL SULLIVAN

Dr. Michael Sullivan, who had practiced in Adrian, Minnesota, for forty-one years, prior to his retirement in 1921 when he moved to Alhambra, California, died April 19, 1943 in Alhambra.

Dr. Sullivan was born on a farm in New York state in 1852. The following year his parents moved to Wisconsin and shortly afterwards to Dallas County, Iowa.

He obtained his medical degree from the College of Physicians and Surgeons at Keokuk, Iowa, in 1878 and practiced two years at Luverne, Minnesota, before locating in Adrian.

Dr. Sullivan was appointed a pension medical examiner in 1880 by President Hayes. He served three terms as mayor of Adrian and was postmaster for four years, having been appointed by President Cleveland.

Dr. Sullivan is survived by two daughters, Mrs. Catherine Burley and Mrs. Carl C. Cowan, both of whom live in California.

VIRUS DESTROYED WITH LIGHT

Destruction by ultraviolet light of the virus type of disease germ depends on hitting a certain vital spot or "Achilles heel" of the virus, Dr. Harvey C. Rentschler, director of research at the Westinghouse Lamp Division, declared.

His statement was based on thousands of tests in which bacteriophage, a virus that destroys bacteria, was subjected to an ultraviolet light barrage.

"This ability of ultraviolet to inactivate virus," Dr. Rentschler said, "means that science now has an effective weapon to use in the battle against influenza, infantile paralysis and the common cold among other diseases thought to be caused by virus."—*Science News Letter,* April 3, 1943.

Minnesota State Medical Association

ROSTER 1943

OFFICERS 1943

S. H. Baxter, M.D.	*President*	Minneapolis
J. F. Norman, M.D.	*First Vice President*	Crookston
F. W. Lynch, M.D.	*Second Vice President*	Saint Paul
B. B. Souster, M.D.	*Secretary*	Saint Paul
W. H. Condit, M.D.	*Treasurer*	Minneapolis
H. Z. Giffin, M.D.	*Past President*	Rochester
W. W. Will, M.D.	*Speaker, House of Delegates*	Bertha
E. A. Meyerding, M.D.	*Vice Speaker, House of Delegates*	Saint Paul
R. R. Rosell	*Executive Secretary*	Saint Paul

COUNCILORS*

First District
L. A. Buie, M.D. (1944) ..... Rochester

Second District
L. L. Sogge, M.D. (1944) ..... Windom

Third District
C. M. Johnson, M.D. (1943) ..... Dawson

Fourth District
A. E. Sohmer, M.D. (1945) ..... Mankato

Fifth District
E. M. Jones, M.D. (1943) ..... Saint Paul

Sixth District
A. E. Cardle, M.D. (1945) ..... Minneapolis

Seventh District
E. J. Simons, M.D. (1943) ..... Swanville

Eighth District
W. L. Burnap, M.D. (1945) (Chairman) .. Fergus Falls

Ninth District
F. J. Elias, M.D. (1944) ..... Duluth

HOUSE OF DELEGATES, AMERICAN MEDICAL ASSOCIATION*

Members
W. A. Coventry, M.D. (1944) ..... Duluth
A. W. Adson, M.D. (1944) ..... Rochester
F. J. Savage, M.D. (1943) ..... Saint Paul
J. M. Hayes, M.D. (1943) ..... Minneapolis

Alternates
J. C. Hultkrans, M.D. (1944) ..... Minneapolis
W. L. Burnap, M.D. (1944) ..... Fergus Falls
George Earl, M.D. (1943) .. .. Saint Paul
W. W. Will, M.D. (1943) ..... Bertha

SCIENTIFIC COMMITTEES

COMMITTEE ON SCIENTIFIC ASSEMBLY

S. H. Baxter, M.D., General Chairman ..... Minneapolis
H. Z. Giffin, M.D. ..... Rochester
R. R. Rosell ..... Saint Paul

Section on Medicine

F. J. Hirschboeck, M.D. ..... Duluth
W. B. Roberts, M.D. ..... Minneapolis

Section on Surgery

J. M. Waugh ..... Rochester
H. W. Goehrs, M.D. ..... Saint Cloud

Section on Specialties

T. R. Fritsche, M.D. ..... New Ulm
J. R. Aurelius, M.D. ..... Saint Paul

Local Arrangements

R. R. Cranmer, M.D. ..... Minneapolis

COMMITTEE ON CANCER*

M. W. Alberts, M.D. (1944) ..... Saint Paul
J. K. Anderson, M.D. (1945) ..... Minneapolis
Charles Bolsta, M.D. (1943) ..... Ortonville
Herbert Boysen, M.D. (1943) ..... Madelia
O. J. Hagen, M.D. (1945) ..... Moorhead
E. C. Hartley, M.D. (1943) ..... Saint Paul
R. W. Koucky, M.D. (1943) ..... Minneapolis
F. H. Magney, M.D. (1945) ..... Duluth
J. R. Manley, M.D. (1944) ..... Duluth
Martin Nordland, M.D. (1945) ..... Minneapolis
W. T. Peyton, M.D. (1944) ..... University
W. C. MacCarty, M.D., Sr. (1944) (ex officio) ..... Rochester

*Terms expire December 31, of year indicated.

COMMITTEE ON FRACTURES

V. P. Hauser, M.D., General Chairman ..... Saint Paul

Executive Committee on Fractures

V. P. Hauser, M.D. ..... Saint Paul
N. H. Baker, M.D. ..... Fergus Falls
A. N. Collins, M.D. ..... Duluth
L. T. Davis, M.D. ..... Wadena
R. K. Ghormley, M.D. ..... Rochester
L. G. Rigler, M.D. ..... University
J. A. Thabes, M.D. (Jr.) ..... Brainerd
R. C. Webb, M.D. ..... Minneapolis
Nels Westby, M.D. ..... Madison
O. W. Yoerg, M.D. ..... Minneapolis

COMMITTEE ON INDUSTRIAL HEALTH

A. E. Wilcox, M.D. ..... Minneapolis
H. B. Allen, M.D. ..... Austin
L. S. Arling, M.D. ..... Minneapolis
Martin Aune, M.D. ..... Minneapolis
Richard Bardon, M.D. ..... Duluth
P. H. Bennion, M.D. ..... Saint Paul
R. B. Bray, M.D. ..... Biwabik
R. P. Caron, M.D. ..... Minneapolis
T. H. Dickson, M.D. ..... Saint Paul
T. A. Lowe, M.D. ..... South Saint Paul
J. L. McLeod, M.D. ..... Grand Rapids
C. M. Smith, M.D. ..... Duluth
H. G. Wood, M.D. ..... Rochester

COMMITTEE ON DIABETES

J. R. Meade, M.D. ..... Saint Paul
‡R. W. Cranston, M.D. ..... Minneapolis
C. N. Harris, M.D. ..... Hibbing
F. R. Huxley, M.D. ..... Faribault
Harry Oerting, M.D. ..... Saint Paul
A. A. Passer, M.D. ..... Olivia
B. F. Pearson, M.D. ..... Shakopee
E. H. Rynearson, M.D. ..... Rochester
R. V. Sherman, M.D. ..... Red Wing
C. J. Watson, M.D. ..... University

‡In service.

NON-SCIENTIFIC COMMITTEES

COMMITTEE ON PUBLIC POLICY

L. L. Sogge, M.D. ..... Windom
G. I. Badeaux, M.D. ..... Brainerd
L. A. Barney, M.D. ..... Duluth
J. F. DuBois, M.D. ..... Sauk Center
E. A. Eberlin, M.D. ..... Glenwood
W. A. Fansler, M.D. ..... Minneapolis
R. C. Gray, M.D. ..... Cambridge
H. C. Habein, M.D. ..... Rochester
J. M. Hayes, M.D. ..... Minneapolis
M. O. Oppegaard, M.D. ..... Crookston
W. C. Rutherford, M.D. ..... Saint Paul
H. R. Tregilgas, M.D. ..... South Saint Paul

INTERPROFESSIONAL RELATIONS COMMITTEE

F. J. Savage, M.D. ..... Saint Paul
C. C. Allen, M.D. ..... Austin
E. C. Bayley, M.D. ..... Lake City
J. J. Catlin, M.D. ..... Buffalo
E. E. Christensen, M.D. ..... Winona
C. O. Estrem, M.D. ..... Fergus Falls
O. O. Larsen, M.D. ..... Detroit Lakes
C. W. Mayo, M.D. ..... Rochester
W. L. Palmer, M.D. ..... Albert Lea
A. A. Passer, M.D. ..... Olivia
C. E. Proshek, M.D. ..... Minneapolis
C. E. Rea, M.D. ..... Saint Paul

COMMITTEE ON UNIVERSITY RELATIONS

H. Z. Giffin, M.D. ..... Rochester
B. J. Branton, M.D. ..... Willmar
B. S. Adams, M.D. ..... Hibbing
George Earl, M.D. ..... Saint Paul
J. M. Hayes, M.D. ..... Minneapolis

EDITING AND PUBLISHING COMMITTEE*

E. M. Hammes, M.D. (1946) ..... Saint Paul
P. F. Donohue, M.D. (1943) ..... Saint Paul
H. W. Meyerding, M.D. (1944) ..... Rochester
B. O. Mork, M.D. (Jr.) (1946) ..... Worthington
C. L. Oppegaard, M.D. (1945) ..... Crookston
T. A. Peppard, M.D. (1947) ..... Minneapolis
H. A. Roust, M.D. (1943) ..... Montevideo
O. W. Rowe, M.D. (1947) ..... Duluth
A. H. Wells, M.D. (1944) ..... Duluth
H. L. Ulrich, M.D. (1945) ..... Minneapolis

COMMITTEE ON PUBLIC HEALTH EDUCATION

E. L. Tuohy, M.D., General Chairman ..... Duluth

Executive

E. L. Tuohy, M.D. ..... Duluth
R. M. Burns, M.D. ..... Saint Paul
R. M. Hewitt, M.D. ..... Rochester
F. H. Magney, M.D. ..... Duluth
Chairmen of all Scientific Committees

Radio

R. M. Burns, M.D. ..... Saint Paul
J. K. Anderson, M.D. ..... Minneapolis
M. J. Anderson, M.D. ..... Rochester
R. N. Andrews, M.D. ..... Mankato
Elizabeth C. Bagley, M.D. ..... Duluth
P. M. Gamble, M.D. ..... Albert Lea
E. A. Heiberg, M.D. ..... Fergus Falls
R. N. Jones, M.D. ..... Saint Cloud
E. N. Peterson, M.D. ..... Virginia
E. D. Risser, M.D. ..... Winona

Speakers Bureau

F. H. Magney, M.D. ..... Duluth
R. M. Burns, M.D. ..... Saint Paul
L. A. Hilger, M.D. ..... Saint Paul
P. J. Hiniker, M.D. ..... Le Sueur
P. A. Lommen, M.D. ..... Austin
J. F. Norman, M.D. ..... Crookston
R. C. Radabaugh, M.D. ..... Hastings
C. P. Robbins, M.D. ..... Winona
T. W. Weum, M.D. ..... Minneapolis

Editorial

R. M. Hewitt, M.D. ..... Rochester
R. P. Buckley, M.D. ..... Duluth
G. W. Clifford, M.D. ..... Alexandria
T. J. Edwards, M.D. ..... Saint Paul
W. W. Spink, M.D. ..... University

*Terms expire December 31, of year indicated.

COMMITTEE ON MEDICAL ECONOMICS

George Earl, M.D., General Chairman ..... Saint Paul

Executive

George Earl, M.D. ..... Saint Paul
A. W. Adson, M.D., Vice Chairman ..... Rochester
R. D. Mussey, M.D. ..... Rochester
W. A. Coventry, M.D. ..... Duluth
W. H. Hengstler, M.D. ..... Saint Paul
F. A. Olson, M.D. ..... Minneapolis
L. L. Sogge, M.D. ..... Windom
T. H. Sweetser, M.D. ..... Minneapolis
E. L. Tuohy, M.D. ..... Duluth

Editorial

George Earl, M.D. ..... Saint Paul
W. F. Braasch, M.D. ..... Rochester
A. N. Collins, M.D. ..... Duluth
J. M. Hayes, M.D. ..... Minneapolis
F. J. Savage, M.D. ..... Saint Paul

Medical Ethics

R. D. Mussey, M.D. ..... Rochester
B. S. Adams, M.D. ..... Hibbing
H. S. Diehl, M.D. ..... University

Medical Advisory

W. H. Hengstler, M.D., Chairman ..... Saint Paul
B. J. Branton, M.D. ..... Willmar
Ivar Sivertsen, M.D. ..... Minneapolis

State Health Relations

T. H. Sweetser, M.D. ..... Minneapolis
E. S. Boleyn, M.D. ..... Stillwater
W. S. Broker, M.D. ..... Wadena
J. N. Dunn, M.D. ..... Saint Paul
C. L. Haney, M.D. ..... Duluth
R. R. Heim, M.D. ..... Minneapolis
C. M. Johnson, M.D. ..... Dawson
D. E. McBroom, M.D. ..... Cambridge
J. P. McDowell, M.D. ..... Saint Cloud
J. L. McLeod, M.D. ..... Grand Rapids
S. A. Slater, M.D. ..... Worthington

Low Income and Indigent Problems

W. A. Coventry, M.D. ..... Duluth
M. W. Binger, M.D. ..... Rochester
J. A. McIntyre, M.D. ..... Owatonna
I. L. Oliver, M.D. ..... Graceville
C. L. Oppegaard, M.D. ..... Crookston
C. A. Saffert, M.D. ..... New Ulm
C. L. Sherman, M.D. ..... Luverne
L. I. Younger, M.D. ..... Winona
A. H. Zachman, M.D. ..... Melrose

Sickness Insurance

A. W. Adson, M.D. ..... Rochester
R. R. Cranmer, M.D. ..... Minneapolis
J. E. Crewe, M.D. ..... Rochester
V. P. Hauser, M.D. ..... Saint Paul
F. J. Hirschboeck, M.D. ..... Duluth
F. R. Hirshfield, M.D. ..... Minneapolis
O. W. Holcomb, M.D. ..... Saint Paul
E. W. Johnson, M.D. ..... Bemidji
C. B. McKaig, M.D. ..... Pine Island
C. A. McKinlay, M.D. ..... Minneapolis
J. L. Mills, M.D. ..... Winnebago
O. I. Sohberg, M.D. ..... Saint Paul
W. W. Will, M.D. ..... Bertha

Industrial and Contract Practice

F. A. Olson, M.D. ..... Minneapolis
A. M. Aanes, M.D. ..... Red Wing
N. H. Baker, M.D. ..... Fergus Falls
C. C. Chatterton, M.D. ..... Saint Paul
W. H. Cole, M.D. ..... Saint Paul
G. R. Dunn, M.D. ..... Minneapolis
M. S. Henderson, M.D. ..... Rochester
Clarence Jacobson, M.D. ..... Chisholm
O. L. McHaffie, M.D. ..... Duluth
R. F. McGandy, M.D. ..... Minneapolis
E. N. Peterson, M.D. ..... Eveleth
C. M. Smith, M.D. ..... Duluth

MINNESOTA STATE CERTIFICATION BOARD ON PUBLIC HEALTH NURSING

F. J. Savage, M.D. ..... Saint Paul

HEART COMMITTEE*

F. J. Hirschboeck, M.D. (1945) ..... Duluth
J. M. Adams, M.D. (1944) ..... Minneapolis
H. E. Binet, M.D. (1943) ..... Grand Rapids
C. A. Boline, M.D. (1943) ..... Battle Lake
P. G. Boman, M.D. (1945) ..... Duluth
C. S. Donaldson, M.D. (1944) ..... Foley
E. H. Frost, M.D. (1944) ..... Willmar
C. N. Hensel, M.D. (1943) ..... Saint Paul
Charles Koenigsberger, M.D. (1944) ..... Mankato
C. M. Robilliard, M.D. (1945) ..... Faribault
H. L. Smith, M.D. (1945) ..... Rochester
S. M. White, M.D. (1943) ..... Minneapolis

COMMITTEE ON SYPHILIS AND SOCIAL DISEASES

P. A. O'Leary, M.D. ..... Rochester
C. A. Boreen, M.D. ..... Minneapolis
B. T. Bottolfson, M.D. ..... Moorhead
Edward Bratrud, M.D. ..... Thief River Falls
J. M. Culligan, M.D. ..... Saint Paul
C. D. Freeman, M.D. ..... Saint Paul
W. E. Hatch, M.D. ..... Duluth
H. G. Irvine, M.D. ..... Minneapolis
S. E. Sweitzer, M.D. ..... Minneapolis

COMMITTEE ON CONSERVATION OF HEARING

Horace Newhart, M.D. ..... Minneapolis
L. R. Boies, M.D. ..... Minneapolis
W. L. Burnap, M.D. ..... Fergus Falls
C. E. Connor, M.D. ..... Saint Paul
K. R. Fawcett, M.D. ..... Duluth
F. E. Harrington, M.D. ..... Minneapolis
H. I. Lillie, M.D. ..... Rochester
E. A. Loomis, M.D. ..... Minneapolis
H. A. Roust, M.D. ..... Montevideo
J. T. Schlesselman, M.D. ..... Mankato
Andrew Sinamark, M.D. ..... Hibbing
G. E. Strate, M.D. ..... Saint Paul
D. L. Tilderquist, M.D. ..... Duluth
G. H. Walker, M.D. ..... Winona
W. T. Wenner, M.D. ..... Saint Cloud
L. M. Elstad (ex officio) ..... Faribault
H. E. Hartig (ex officio) ..... University

COMMITTEE ON OPHTHALMOLOGY

T. R. Fritsche, M.D. ..... New Ulm
W. L. Benedict, M.D. ..... Rochester
H. E. Binger, M.D. ..... Saint Paul
W. E. Camp, M.D. ..... Minneapolis
L. G. Dack, M.D. ..... Saint Paul
F. P. Frisch, M.D. ..... Willmar
J. S. Macnie, M.D. ..... Minneapolis
V. I. Miller, M.D. ..... Mankato
L. W. Morsman, M.D. ..... Hibbing
G. H. Walker, M.D. ..... Winona
W. T. Wenner, M.D. ..... Saint Cloud

COMMITTEE ON HOSPITALS AND MEDICAL EDUCATION

H. S. Diehl, M.D. ..... University
D. C. Balfour, M.D. ..... Rochester
Moses Barron, M.D. ..... Minneapolis
S. H. Boyer, M.D. (Sr.) ..... Duluth
A. F. Branton, M.D. ..... Willmar
A. R. Colvin, M.D. ..... Saint Paul
H. C. Cooney, M.D. ..... Princeton
C. C. Kennedy, M.D. ..... Minneapolis
C. I. Oliver, M.D. ..... Graceville
W. H. Valentine, M.D. ..... Tracy
W. A. O'Brien, M.D. (ex officio) ..... University

COMMITTEE ON PUBLIC HEALTH NURSING

C. A. Scherer, M.D. ..... Duluth
W. C. Chambers, M.D. ..... Blue Earth
T. F. Hammermeister, M.D. ..... New Ulm
F. E. Harrington, M.D. ..... Minneapolis
E. Haugseth, M.D. ..... Twin Valley
H. L. Lamb, M.D. ..... Little Falls
G. H. Mesker, M.D. ..... Olivia
F. M. Manson, M.D. (ex officio) ..... Worthington

COMMITTEE ON MATERNAL HEALTH

R. J. Moe, M.D. ..... Duluth
R. N. Andrews, M.D. ..... Mankato
T. J. Devereaux, M.D. ..... Wayzata
A. D. Hoidale, M.D. ..... Tracy
A. B. Hunt, M.D. ..... Rochester
F. J. Kucera, M.D. ..... Hopkins
R. T. LaVake, M.D. ..... Minneapolis
J. C. Litzenberg, M.D. ..... Minneapolis
J. L. McKelvey, M.D. ..... University
D. E. Morehead, M.D. ..... Owatonna
F. J. Schatz, M.D. ..... Saint Cloud
J. J. Swendson, M.D. ..... Saint Paul

*Terms expire December 31, of year indicated.

COMMITTEE ON MEDICAL TESTIMONY

E. M. Hammes, M.D. ..... Saint Paul
B. S. Adams, M.D. ..... Hibbing
H. B. Annis, M.D. ..... Minneapolis
L. A. Barney, M.D. ..... Duluth
G. R. Dunn, M.D. ..... Minneapolis
J. F. Norman, M.D. ..... Crookston
W. G. Workman, M.D. ..... Tracy

COMMITTEE ON CHILD HEALTH

R. L. J. Kennedy, M.D. ..... Rochester
L. R. Critchfield, M.D. ..... Saint Paul
H. F. Helmholz, M.D. ..... Rochester
R. J. Josewski, M.D. ..... Stillwater
Elizabeth C. Lowry, M.D. ..... Minneapolis
E. E. Novak, M.D. ..... New Prague
M. J. Nydahl, M.D. ..... Saint Paul
Lillian L. Nye, M.D. ..... Saint Paul
L. F. Richdorf, M.D. ..... Minneapolis
M. J. Shapiro, M.D. ..... Minneapolis
Irvine McQuarrie, M.D. (ex officio) ..... University

COMMITTEE ON MILITARY AFFAIRS

Col. F. L. Smith ..... Rochester
Lt. Col. J. J. Catlin ..... Buffalo
Major M. G. Gillespie ..... Duluth
Major Z. E. House ..... Cass Lake
Lt. Col. R. B. Hullsiek ..... Saint Paul
Col. R. T. Knight ..... Minneapolis
Lt. Col. J. J. Morrow ..... Austin
Lt. C. S. Strathern ..... Saint Peter
Lt. Col. W. G. Workman ..... Tracy

HISTORICAL COMMITTEE

M. C. Piper, M.D. ..... Rochester
H. B. Annis, M.D. ..... Minneapolis
Olga Hansen, M.D. ..... Minneapolis
F. R. Huxley, M.D. ..... Faribault
W. L. Palmer, M.D. ..... Albert Lea
C. L. Scofield, M.D. ..... Benson
G. E. Sherwood, M.D. ..... Kimball
F. P. Strathern, M.D. ..... Saint Peter
J. A. Thabes, M.D. (Sr.) ..... Brainerd
E. L. Tuohy, M.D. ..... Duluth
J. M. Armstrong, M.D. (ex officio) ..... Sant Paul

COMMITTEE ON VACCINATION AND IMMUNIZATION

E. J. Huenekens, M.D. ..... Minneapolis
A. J. Chesley, M.D. ..... Saint Paul
D. A. Dukelow, M.D. ..... Minneapolis
E. C. Gaines, M.D. ..... Buffalo Lake
F. E. Harrington, M.D. ..... Minneapolis
W. W. Higgs, M.D. ..... Park Rapids
H. M. Keith, M.D. ..... Rochester
C. O. Kohlbry, M.D. ..... Duluth
R. B. J. Schoch, M.D. ..... Saint Paul
F. P. Strathern, M.D. ..... Saint Peter

COMMITTEE TO STUDY PSYCHOPATHIC PERSONALITIES

G. R. Kamman, M.D. ..... Saint Paul
A. G. Dumas, M.D. ..... Minneapolis
R. C. Gray, M.D. ..... Minneapolis
J. C. McKinley, M.D. ..... University
J. C. Michael, M.D. ..... Minneapolis
F. P. Moersch, M.D. ..... Rochester
A. S. Nissen, M.D. ..... Duluth
W. L. Patterson, M.D. ..... Fergus Falls
M. C. Petersen, M.D. ..... Rochester
G. N. Ruhberg, M.D. ..... Saint Paul

COMMITTEE ON FIRST AID AND RED CROSS

J. S. Lundy, M.D. ..... Rochester
H. R. Anderson, M.D. ..... Deer River
L. C. Barr, M.D. ..... Albert Lea
E. S. Boleyn, M.D. ..... Stillwater
C. J. Potthoff, M.D. ..... University
W. W. Rieke, M.D. ..... Wayzata
C. B. Teisberg, M.D. ..... Saint Paul

COMMITTEE ON TUBERCULOSIS

J. A. Myers, M.D. ..... Minneapolis
W. H. Aurand, M.D. ..... Minneapolis
H. A. Burns, M.D. ..... Saint Paul
S. S. Cohen, M.D. ..... Oak Terrace
K. A. Danielson, M.D. ..... Litchfield
L. H. Flancher, M.D. ..... Minneapolis
E. K. Geer, M.D. ..... Saint Paul
G. A. Hedberg, M.D. ..... Nopeming
A. J. Henderson, M.D. ..... Kiester
R. R. Hendrickson, M.D. ..... Lake Park
H. C. Hinshaw, M.D. ..... Rochester
E. A. Meyerding, M.D. ..... Saint Paul
K. H. Pfuetze, M.D. ..... Cannon Falls
C. L. Scofield, M.D. ..... Benson
S. A. Slater, M.D. ..... Worthington
W. H. Feldman, (ex officio) ..... Rochester

COUNTY MEDICAL ADVISORY COMMITTEES

AITKIN COUNTY

J. J. Ratcliffe, M.D. ..... Aitkin
C. E. Carlson, M.D. ..... Aitkin
H. T. Petraborg, M.D. ..... Aitkin

ANOKA COUNTY

R. J. Spurzem, M.D. ..... Anoka
George Schlesselman, M.D. ..... Anoka
F. E. Mork, M.D. ..... Anoka

BECKER COUNTY

H. C. Otto, M.D. ..... Frazee
A. R. Ellingson, M.D. ..... Detroit Lakes
G. G. Haight, M.D. ..... Audubon

BELTRAMI COUNTY

D. J. Jacobson, M.D. ..... Bemidji
D. H. Garlock, M.D. ..... Bemidji
T. P. Groschupf, M.D. ..... Bemidji

BENTON COUNTY

William Friesleben, M.D. ..... Sauk Rapids
N. F. Musachio, M.D. ..... Foley
C. S. Donaldson, M.D. ..... Foley

BIG STONE COUNTY

C. I. Oliver, M.D. ..... Graceville
Otto Bergan, M.D. ..... Clinton
B. R. Karn, M.D. ..... Ortonville

BLUE EARTH COUNTY

R. N. Andrews, M.D. ..... Mankato
R. G. Hassett, M.D. ..... Mankato

BROWN COUNTY

Albert Fritsche, M.D. ..... New Ulm
C. A. Saffert, M.D. ..... New Ulm
W. G. Nuessle, M.D. ..... Springfield
O. B. Fesenmaier, M.D. ..... New Ulm

CARLTON COUNTY

R. M. Eppard, M.D. ..... Cloquet
E. O. Hanson, M.D. ..... Cloquet
J. K. Butler, M.D. ..... Carlton

CARVER COUNTY

M. B. Hebeisen, M.D. ..... Chaska
H. D. Nagel, M.D. ..... Waconia
B. H. Simons, M.D. ..... Chaska

CASS COUNTY

O. F. Ringle, M.D. ..... Walker
G. H. Adkins, M.D. ..... Pine River
C. E. Johnson, M.D. ..... Pine River

CHIPPEWA COUNTY

L. G. Smith, M.D. ..... Montevideo
M. A. Burns, M.D. ..... Milan
H. A. Roust, M.D. ..... Montevideo

CHISAGO COUNTY

J. E. Halpin, M.D. ..... Rush City
A. E. Holmes, M.D. ..... Rush City
R. G. Swensen, M.D. ..... North Branch

CLAY COUNTY

O. H. Johnson, M.D. ..... Moorhead
F. A. Thysell, M.D. ..... Moorhead
S. B. Seitz, M.D. ..... Barnesville

CLEARWATER COUNTY

L. J. Larson, M.D. ..... Bagley
R. D. Davis, M.D. ..... Clearbook

COTTONWOOD COUNTY

H. C. Stratte, M.D. ..... Windom
E. S. Schutz, M.D. ..... Mountain Lake
J. V. Carlson, M.D. ..... Westbrook

CROW WING COUNTY

V. E. Quanstrom, M.D. ..... Brainerd
G. I. Badeaux, M.D. ..... Brainerd

DAKOTA COUNTY

G. F. Walter, M.D. ..... Farmington
L. R. Peck, M.D. ..... Hastings
A. J. Emond, M.D. ..... Farmington

DODGE COUNTY

C. E. Bigelow, M.D. ..... Dodge Center
H. R. Baker, M.D. ..... Hayfield
D. E. Affeldt, M.D. ..... Kasson

DOUGLAS COUNTY

G. W. Clifford, M.D. ..... Alexandria
L. M. Boyd, M.D. ..... Alexandria
A. R. Blakey, M.D. ..... Osakis

FARIBAULT COUNTY

W. C. Chambers, M.D. ..... Blue Earth
M. D. Cooper, M.D. ..... Winnebago
W. H. Barr, M.D. ..... Wells

FILLMORE COUNTY

C. W. Woodruff, M.D. ..... Chatfield
J. E. Westrup, M.D. ..... Lanesboro
L. W. Clark, M.D. ..... Spring Valley

FREEBORN COUNTY

C. F. Palmer, M.D. ..... Albert Lea
W. P. Freligh, M.D. ..... Albert Lea
P. M. Gamble, M.D. ..... Albert Lea
F. G. Folken, M.D. ..... Albert Lea

GOODHUE COUNTY

W. W. Liffrig, M.D. ..... Red Wing
E. H. Juers, M.D. ..... Red Wing
L. A. Steffens, M.D. ..... Red Wing

GRANT COUNTY

L. R. Parson, M.D. ..... Elbow Lake
E. T. Reeve, M.D. ..... Elbow Lake
A. M. Randall, M.D. ..... Ashby

RURAL HENNEPIN COUNTY

T. J. Devereaux, M.D. ..... Wayzata
M. H. Seifert, M.D. ..... Excelsior
F. J. Kucera, M.D. ..... Hopkins

HOUSTON COUNTY

J. W. Helland, M.D. ..... Spring Grove
G. T. Norris, M.D. ..... Caledonia
L. K. Onsgard, M.D. ..... Houston

HUBBARD COUNTY

W. W. Higgs, M.D. ..... Park Rapids

ISANTI COUNTY

L. H. Hedenstrom, M.D. ..... Cambridge
W. T. Nygren, M.D. ..... Braham

ITASCA COUNTY

J. L. McLeod, M.D. ..... Grand Rapids
H. R. Anderson, M.D. ..... Deer River
E. K. Rowles, M.D. ..... Coleraine

JACKSON COUNTY

A. G. Chadbourn, M.D. ..... Heron Lake
W. S. Hitchings, M.D. ..... Lakefield
W. H. Halloran, M.D. ..... Jackson

KANABEC COUNTY

C. S. Bossert, M.D. ..... Mora
A. A. Peterson, M.D. ..... Mora
W. F. Nordman, M.D. ..... Mora

KANDIYOHI COUNTY

G. U. Y. Frederickson, M.D. ..... Willmar
R. K. Proeschel, M.D. ..... Willmar

KITTSON COUNTY

A. W. Shaleen, M.D. ..... Hallock
F. F. Stocking, M.D. ..... Hallock
A. S. Berlin, M.D. ..... Hallock

KOOCHICHING COUNTY

M. E. Withrow, M.D. ..... International Falls
C. C. Craig, M.D. ..... International Falls
R. D. Hanover, M.D. ..... Little Fork

LAC QUI PARLE COUNTY

M. Westby, M.D. ..... Madison
C. M. Johnson, M.D. ..... Dawson
W. M. Lee, M.D. ..... Madison

LAKE COUNTY

E. P. Christenson, M.D. ..... Two Harbors
R. F. Mueller, M.D. ..... Two Harbors

LINCOLN COUNTY

A. L. Vadheim, M.D. ..... Tyler
P. E. Hermanson, M.D. ..... Hendricks
George Friedell, M.D. ..... Ivanhoe

LYON COUNTY

B. C. Ford, M.D. ..... Marshall
A. D. Hoidale, M.D. ..... Tracy
E. T. Sanderson, M.D. ..... Minneota

MAHNOMEN COUNTY
J. J. Ederer, M.D. ..... Mahnomen

MARSHALL COUNTY
O. F. Mellby, M.D. ..... Thief River Falls
I. G. Wiltrout, M.D. ..... Oslo
C. H. Holstrom, M.D. ..... Warren

MARTIN COUNTY
R. C. Hunt, M.D. ..... Fairmont
H. B. Bailey, M.D. ..... Fairmont
J. J. Heimark, M.D. ..... Fairmont

McLEOD COUNTY
H. H. Holm, M.D. ..... Glencoe
O. W. Scholpp, M.D. ..... Hutchinson
E. W. Lippmann, M.D. ..... Hutchinson

MEEKER COUNTY
G. K. Sellers, M.D. ..... Dassel
D. C. O'Connor, M.D. ..... Eden Valley

MILLE LACS COUNTY
H. C. Cooney, M.D. ..... Princeton
Melvin Vik, M.D. ..... Onamia
C. J. Henry, M.D. ..... Milaca

MORRISON COUNTY
J. B. Holst, M.D. ..... Little Falls
H. L. Lamb, M.D. ..... Little Falls
E. J. Simons, M.D. ..... Swanville

MOWER COUNTY
R. S. Hegge, M.D. ..... Austin
C. L. Sheedy, M.D. ..... Austin
L. G. Flanagan, M.D. ..... Austin

MURRAY COUNTY
L. A. Williams, M.D. ..... Slayton
B. M. Stevenson, M.D. ..... Fulda
J. T. Larson, M.D. ..... Lake Wilson

NICOLLET COUNTY
M. H. Larson, M.D. ..... Nicollet
F. P. Strathern, M.D. ..... St. Peter
H. J. Nilson, M.D. ..... North Mankato

NOBLES COUNTY
J. D. Waller, M.D. ..... Wilmont
B. O. Mork, Sr., M.D. ..... Worthington
E. A. Kilbride, M.D. ..... Worthington

NORMAN COUNTY
Eskil Erickson, M.D. ..... Halstad
G. W. Bohl, M.D. ..... Ada
Theodore Loken, M.D. ..... Ada

OLMSTED COUNTY
M. W. Binger, M.D. ..... Rochester
F. D. Smith, M.D. ..... Rochester
C. B. McKaig, M.D. ..... Pine Island

OTTER TAIL COUNTY
A. J. Lewis, M.D. ..... Henning
W. L. Burnap, M.D. ..... Fergus Falls
G. C. Jacobs, M.D. ..... Fergus Falls

PENNINGTON COUNTY
O. F. Mellby, M.D. ..... Thief River Falls
O. G. Lynde, M.D. ..... Thief River Falls
H. K. Helseth, M.D. ..... Thief River Falls

PINE COUNTY
C. G. Kelsey, M.D. ..... Hinckley
G. E. Brown, M.D. ..... Pine City
Manuel Brownstone, M.D. ..... Sandstone

PIPESTONE COUNTY
W. G. Benjamin, M.D. ..... Pipestone
G. Beckering, M.D. ..... Edgerton
J. G. Lohmann, M.D. ..... Jasper

POLK COUNTY
C. L. Oppegaard, M.D. ..... Crookston
J. F. Norman, M.D. ..... Crookston
Abraham Shedlov, M.D. ..... Fosston

POPE COUNTY
E. A. Eberlin, M.D. ..... Glenwood
B. I. McIver, M.D. ..... Lowry

REDWOOD COUNTY
R. A. Peterson, M.D. ..... Vesta
T. E. Flinn, M.D. ..... Redwood Falls

RENVILLE COUNTY
J. Dordal, M.D. ..... Sacred Heart
W. J. Bushard, M.D. ..... Bird Island
A. M. Fawcett, M.D. ..... Renville
R. E. Erickson, M.D. ..... Hector
J. A. Cosgriff, M.D. ..... Olivia

RICE COUNTY
F. R. Huxley, M.D. ..... Faribault
D. W. Francis, M.D. ..... Morristown
Warren Wilson, M.D. ..... Northfield

ROCK COUNTY
C. L. Sherman, M.D. ..... Luverne
C. O. Wright, M.D. ..... Luverne
F. W. Bofenkamp, M.D. ..... Luverne

ROSEAU COUNTY
J. L. Delmore, M.D. ..... Roseau
N. M. Leitch, M.D. ..... Warroad
D. O. Berge, M.D. ..... Roseau

ST. LOUIS COUNTY
A. G. Athens, M.D. ..... Duluth
P. G. Boman, M.D. ..... Duluth
R. B. Bray, M.D. ..... Biwabik

SCOTT COUNTY
H. M. Juergens, M.D. ..... Belle Plaine
B. F. Pearson, M.D. ..... Shakopee

SHERBURNE COUNTY
A. B. Roehlke, M.D. ..... Elk River
E. F. Clothier, M.D. ..... Elk River
Gordon H. Tesch, M.D. ..... Elk River

SIBLEY COUNTY
Rolf Hovde, M.D. ..... Winthrop
Thomas Martin, M.D. ..... Arlington
D. C. Olson, M.D. ..... Gaylord

STEARNS COUNTY
W. T. Wenner, M.D. ..... St. Cloud
A. H. Zachman, M.D. ..... Melrose
C. F. Brigham, M.D. ..... St. Cloud

STEELE COUNTY
D. E. Morehead, M.D. ..... Owatonna
E. J. Nelson, M.D. ..... Owatonna
D. H. Dewey, M.D. ..... Owatonna

STEVENS COUNTY
E. T. Fitzgerald, M.D. ..... Morris
C. E. Caine, M.D. ..... Morris
M. L. Ransom, M.D. ..... Hancock

SWIFT COUNTY
J. M. Arnson, M.D. ..... Benson
W. C. Kaufman, M.D. ..... Appleton
S. W. Giere, M.D. ..... Benson

TODD COUNTY
M. E. Mosby, M.D. ..... Long Prairie
E. J. Simons, M.D. ..... Swanville
J. M. Cook, M.D. ..... Staples

TRAVERSE COUNTY
C. F. Ewing, M.D. ..... Wheaton
N. F. Doleman, M.D. ..... Tintah
A. L. Lindberg, M.D. ..... Wheaton

WABASHA COUNTY
C. G. Ochsner, M.D. ..... Wabasha
D. G. Mahle, M.D. ..... Plainview
W. F. Wilson, M.D. ..... Lake City

WADENA COUNTY
L. T. Davis, M.D. ..... Wadena
H. G. Bosland, M.D. ..... Verndale
C. H. Pierce, M.D. ..... Wadena

WASECA COUNTY
O. J. Swenson, M.D. ..... Waseca
H. M. McIntire, M.D. ..... Waseca
B. J. Gallagher, M.D. ..... Waseca

WASHINGTON COUNTY
W. R. Humphrey, M.D. ..... Stillwater
E. V. Strand, M.D. ..... Bayport
J. W. Stuhr, M.D. ..... Stillwater

WATONWAN COUNTY
Albert Thompson, M.D. ..... St. James
W. J. McCarthy, M.D. ..... Madelia

WILKIN COUNTY
L. H. McMahon, M.D. ..... Breckenridge
W. E. Wray, M.D. ..... Campbell
E. W. Rimer, M.D. ..... Breckenridge

WINONA COUNTY
C. P. Robbins, M.D. ..... Winona
E. E. Christensen, M.D. ..... Winona
G. L. Loomis, M.D. ..... Winona

WRIGHT COUNTY
L. H. Bendix, M.D. ..... Annandale
T. J. Catlin, M.D. ..... Buffalo

YELLOW MEDICINE COUNTY
R. H. Kath, M.D. ..... Wood Lake
M. I. Hauge, M.D. ..... Clarkfield
P. G. Schmidt, Jr., M.D. ..... Granite Falls

(No committees have been appointed in the following counties: Cook, Lake of the Woods, Le Sueur, and Red Lake.)

Woman's Auxiliary

to the

Minnesota State Medical Association

OFFICERS

Mrs. Raymond J. Josewski.....*President*..... Stillwater
Mrs. F. S. McKinney.....*President-Elect*..... Minneapolis
Mrs. John J. Ryan.....*Past President*.....Saint Paul
Mrs. Neil Dungay.....*First Vice President*.....Northfield
Mrs. W. N. Graves.....*Second Vice President*..... Duluth
Mrs. L. P. Howell.....*Third Vice President*.....Rochester
Mrs. E. V. Goltz.....*Recording Secretary*.....Saint Paul
Mrs. C. H. Sherman.....*Corresponding Secretary*.....Stillwater
Mrs. Henry W. Quist.....*Treasurer*..... Minneapolis
Mrs. J. A. Thabes, Sr.....*Auditor*..... Brainerd
Mrs. O. B. Fesenmaier.....*Historian*..... New Ulm
Mrs. E. C. Eshelby.....*Parliamentarian*.....Saint Paul

CHAIRMEN OF COMMITTEES

Advisory—Mrs. James Blake.....Hopkins
Archives—Mrs. H. E. Wunder.....Shakopee
Bulletin—Mrs. S. S. Hesselgrave.....Saint Paul
Co-Chairman—Mrs. R. D. Thielen.....Saint Michael
Editor—Mrs. W. H. Rucker.....Minneapolis
Exhibits—Mrs. Russell Heim.....Minneapolis
Finance—Mrs. J. Dordal.....Sacred Heart
Health Education—Mrs. E. W. Miller.....Saint Peter
Hygeia—Mrs. J. A. Cosgriff.....Olivia
Legislation—Mrs. R. N. Jones.....Saint Cloud
Organization—Mrs. F. S. McKinney.....Minneapolis
Printing—Mrs. Lloyd Dack.....Saint Paul
Public Relations—Mrs. R. V. Sherman.....Red Wing
Resolutions—Mrs. Anthony Bianco.....Duluth
Revisions—Mrs. C. Harry Ghent.....Saint Paul
Social—Mrs. Wm. B. Roberts.....Minneapolis

District Councilors

DISTRICT NO. 1

L. A. Buie, M.D.....Rochester
Counties—Dodge, Fillmore, Freeborn, Goodhue, Houston, Mower, Olmsted, Rice, Steele, Wabasha, Winona.

DISTRICT NO. 2

L. L. Sogge, M.D.....Windom
Counties—Cottonwood, Faribault, Jackson, Martin, Murray, Nobles, Pipestone, Rock, Watonwan.

DISTRICT NO. 3

C. M. Johnson, M.D.....Dawson
Counties—Big Stone, Brown, Chippewa, Kandiyohi, Lac Qui Parle, Lincoln, Lyon, Meeker, Pope, Redwood, Stevens, Swift, Traverse, Yellow Medicine.

DISTRICT NO. 4

A. E. Sohmer, M.D.....Mankato
Counties—Blue Earth, Carver, LeSueur, McLeod, Nicollet, Renville, Scott, Sibley, Waseca.

DISTRICT NO. 5

E. M. Jones, M.D.....St. Paul
Counties—Anoka, Chisago, Dakota, Isanti, Kanabec, Mille Lacs, Pine, Ramsey, Sherburne, Washington

DISTRICT NO. 6

A. E. Cardle, M.D. .....Minneapolis
Counties—Hennepin, Wright

DISTRICT NO. 7

E. J. Simons, M.D.....Swanville
Counties—Aitkin, Beltrami, Benton, Cass, Clearwater, Crow Wing, Hubbard, Koochiching, Morrison, Stearns, Todd, Wadena.

DISTRICT NO. 8

W. L. Burnap, M.D.....Fergus Falls
Counties—Becker, Clay, Douglas, Grant, Kittson, Lake of the Woods, Mahnomen, Marshall, Norman, Otter Tail, Pennington, Polk, Red Lake, Roseau, Wilkin.

DISTRICT NO. 9

F. J. Elias, M.D.....Duluth
Counties—Carlton, Cook, Itasca, Lake, St. Louis.

MINNESOTA STATE MEDICAL ASSOCIATION
COUNTY SOCIETY ROSTER

Key to Symbols: *Deceased; †Affiliate or Associate; ‡In Service

BLUE EARTH COUNTY MEDICAL SOCIETY

Regular meetings, last Monday of each month except June, July and August
Annual meeting in December
Number of Members: 29

President
Andrews, R.N.....Mankato

Secretary
Koenigsberger, Charles.....Mankato

Andrews, R. N.....Mankato
†Black, William.....Mankato
Butzer, J. A.....Mankato
Dahl, G. A.....Mankato
Denman, A. V.....Mankato
Engdahl, F. W.....Mankato
Franchere, F. W.....Lake Crystal
Fugina, G. R.....Mankato
‡Haes, J. E.....Vernon Center
‡Hankerson, R. G.....Minnesota Lake
Hassett, R. G.....Mankato
Hoeper, P. G.....Mankato
Howard, M. I.....Mankato
Jones, O. H.....Madison Lake
Juliar, R. O.....St. Clair
Kemp, A. F.....Mankato
Liedloff, A. G.....Mankato
*Lloyd, H. J.....Mankato
Mickelson, J. C.....Mankato
Miller, V. I.....Mankato
Morgan, H. O.....Amboy
Penn, G. E.....Mankato
‡Samuelson, L. G.....Mankato
Schmidt, P. A.....Good Thunder
Schmitz, A. A.....Mankato
Sohmer, A. E.....Mankato
Stillwell, W. C.....Mankato
‡Troost, H. B.....Mankato
Vezina, J. C.....Mapleton
Wentworth, A. J.....Mankato
Williams, H. O.....Lake Crystal

BLUE EARTH VALLEY MEDICAL SOCIETY

Faribault and Martin Counties

Regular meetings, first Thursday of February, April, June and November
Annual meeting, first Thursday in November
Number of Members: 36

President
Cooper, M.D.....Winnebago

Secretary
Mills, J. L.....Winnebago

Bailey, H. B.....Fairmont
‡Bailey, R. B.....Fairmont
Barr, W. H.....Wells
Bergen, C. T.....Bricelyn
Blanchard, H. G.....Fairmont
Boysen, Herbert.....Madelia
Chambers, W. C.....Blue Earth
Cooper, M. D.....Winnebago
‡Demo, P. W.....Wells
Farrish, R. C.....Sherburn
Fisher, I. I.....Ceylon
Gardner, V. H.....Fairmont
Hanson, Lewis.....Frost
‡Havel, T. E.....Blue Earth
Heimark, J. J.....Fairmont
Henderson, A. J.....Kiester
†Holm, P. F.....Wells
Hunt, R. C.....Fairmont
‡Hunt, R. S.....Fairmont
Hunte, A. F.....Globe, Ariz.
‡Johnson, D. W.....Fairmont
*Johnson, H. P.....Fairmont
‡Krause, C. W.....Fairmont
*Luedtke, G. H.....Fairmont
‡MacMillan, D. G.....Triumph
McGroarty, J. J.....Easton
Mills, J. L.....Winnebago
Parsons, R. L.....Monterey
Raymond, J. H.....Canby
Rowe, W. H.....Fairmont
Russ, H. H.....Blue Earth
Sommer, A. W.....Elmore
‡Sybilrud, H. W.....Bricelyn
Thayer, E. A.....Truman
Vaughan, V. M.....Truman
‡Virnig, M. P.....Wells
Wilson, C. E.....Blue Earth
‡Zemke, E. E.....Fairmont

CAMP RELEASE DISTRICT MEDICAL SOCIETY

Chippewa, Lac Qui Parle and Yellow Medicine Counties

Regular meetings monthly
Annual meeting, December
Number of Members: 24

President
Schmidt, P. G.....Granite Falls

Secretary
Boody, G. J., Jr.....Dawson

Bergh, L. N.....Montevideo
Boody, G. J., Jr.....Dawson
*Burns, F. M.....Milan
Burns, M. A.....Milan
Foshager, H. T.....Clara City
Hauge, M. I.....Clarkfield
Holmberg, L. J.....Canby
Hudec, E. R.....Echo
Johnson, C. M.....Dawson
‡Johnson, V. M.....Dawson
Jordan, L. S.....Granite Falls
Kath, R. H.....Wood Lake
Kaufman, W. C.....Appleton
Lee, W. N.....Madison
Lima, Ludvig.....Montevideo
‡Minge, R. K.....Clarkfield
Nelson, M. S.....Granite Falls
‡Owens, W. A.....Montevideo
Pertl, A. L.....Canby
Roust, H. A.....Montevideo
Schmidt, P. G., Jr.....Granite Falls
Smith, L. G.....Montevideo
Westby, Magnus.....Madison
Westby, Nels.....Madison

CLAY-BECKER COUNTY MEDICAL SOCIETY

Regular meetings three times a year
Annual meeting, January
Number of Members: 23

President
Larsen, O. O.....Detroit Lakes

Secretary
‡Hendrickson, R. R.....Lake Park

†Aborn, W. H.....Hawley
Bottolfson, B. T.....Moorhead
Carman, J. E.....Detroit Lakes
Duncan, J. W.....Moorhead
Ellingson, A. R.....Detroit Lakes
Gosslee, G. L.....Moorhead
Hagen, O. J.....Moorhead
Haight, G. G.....Audubon
‡Hendrickson, R. R.....Lake Park
Humphrey, E. W.....Moorhead
‡Ingebrigtson, E. K. G.....Moorhead
Johnson, Olga H.....Moorhead
Larsen, O. O.....Detroit Lakes
Larson, Arnold.....Detroit Lakes
Moberg, C. W.....Detroit Lakes
Otto, H. C.....Frazee
‡Rice, H. G.....Moorhead
Rutledge, L. H.....Detroit Lakes
Seitz, S. B.....Barnesville
‡Shaw, H. A.....Lake Park
Simison, Carl.....Barnesville
*Simison, C. W.....Hawley
Thysell, F. A.....Moorhead
Thysell, V. D.....Hawley

DAKOTA COUNTY MEDICAL SOCIETY

Number of Members: 9

President
L. S. Burns.....So. St. Paul

Secretary
A. H. Field.....Farmington

Burns, L. S.....So. St. Paul
Emond, A. J.....Farmington
Field, A. H.....Farmington
‡Heinz, Ivy B.....Hastings
‡Heinz, L. H.....Hastings
Peck, L. D.....Hastings
Peck, L. R.....Hastings
Sanford, J. A.....Farmington
Walter, G. F.....Farmington

EAST CENTRAL MINNESOTA MEDICAL SOCIETY

Anoka, Chisago, Isanti, Kanabec, Mille Lacs, Pine and Sherburne Counties
Regular meetings January, March, May, July, September and November
Annual meeting, November
Number of Members: 40

President
Halpin, J. E.....Rush City

Secretary
Arends, A. L.....Cambridge

Arends, A. L.....Cambridge
Blomberg, W. R.....Princeton
Bossert, C. S.....Mora
‡Brink, D. M.....Isle
Brown, G. E.....Pine City
Brownstone, Manuel.....Sandstone
Bunker, B. W.....Anoka
Callahan, F. F.....Ah-Gwah-Ching

Clothier, E. F.....Elk River
Cooney, H. C.....Princeton
†Dedolph, T. H.....Minneapolis
Dredge, H. P.....Sandstone
Gardner, W. P.....Anoka
Gray, R. C.....Minneapolis
Gully, R. J.....Cambridge
Halpin, J. E.....Rush City
Hedenstrom, L. H.....Cambridge
Holmes, A. E.....Rush City
Johnson, A. R.....Isanti
Kelsey, C. G.....Hinckley
McBroom, D. E.....Cambridge
Mork, A. H.....Anoka
Mork, F. E.....Anoka
Nordman, W. F.....Mora
Nygren, W. T.....Braham
O'Hanlon, J. A.....Lindstrom
‡Olson, L. M.....Chisago City
‡Patterson, H. D.....Anoka
Petersen, P. C.....Braham
Peterson, A. A.....Mora
Poore, J. C.....Isle
Roehlke, A. B.....Elk River
Schlesselman, George.....Anoka
Spurzem, R. J.....Anoka
‡Stratte, A. K.....Pine City
Swensen, R. G.....North Branch
Tesch, G. H.....Elk River
Vik, Melvin.....Onamia
Wellner, T. O.....Anoka
‡Whitney, R. A.....Cambridge

FREEBORN COUNTY MEDICAL SOCIETY

Regular meetings, Quarterly
Annual meeting, December
Number of Members: 24

President
Gamble, J. W.....Albert Lea

Secretary
Whitson, S. A.....Albert Lea

Barr, L. C.....Albert Lea
‡Branham, D. S.....Albert Lea
Butturff, C. R.....Freeborn
Calhoun, F. W.....Albert Lea
Donovan, D. L.....Albert Lea
Folken, F. G.....Albert Lea
Freeman, J. P.....Albert Lea
Freligh, W. P.....Albert Lea
Gamble, J. W.....Albert Lea
Gamble, P. M.....Albert Lea
Gullixson, A.....Albert Lea
Kaasa, L. J.....Albert Lea
Kamp, B. A.....Albert Lea
Leopard, B. A.....Albert Lea
‡Neel, H. B.....Albert Lea
‡Nesheim, M. O.....Emmons
Palmer, C. F.....Albert Lea
Palmer, W. L.....Albert Lea
‡Palmerton, E. S.....Albert Lea
Person, J. P.....Alden
‡Prins, L. R.....Albert Lea
Schultz, J. A.....Albert Lea
Swanson, R. R.....Albert Lea
Whitson, S. A.....Albert Lea

GOODHUE COUNTY MEDICAL SOCIETY

Regular meetings, none
Annual meeting, December
Number of Members: 23

President
Claydon, H. F.....Red Wing

Secretary
Brusegard, J. F.....Red Wing

Aanes, A. M.....Red Wing
Anderson, S. H.....Red Wing
Baldigo, E. M.....Red Wing
Brusegard, J. F.....Red Wing
Claydon, H. F.....Red Wing
Claydon, L. E.....Red Wing
Flom, M. G.....Zumbrota
‡Graves, R. B.....Red Wing
‡Hartnagel, G. F.....Red Wing
Hedin, R. F.....Red Wing
Johnson, A. E.....Red Wing
‡Johnson, M. R.....Red Wing
Jones, A. W.....Red Wing
Juers, E. H.....Red Wing
Kimmel, G. C.....Red Wing
Liffrig, W. W.....Red Wing
‡Mack, J. J.....St. Louis, Mo.
McGuigan, H. T.....Red Wing
Sherman, H. T.....Zumbrota
Sherman, R. V.....Red Wing
Smith, M. W.....Red Wing
Steffens, L. A.....Red Wing
Vaaler, T.....Cannon Falls
Williams, M. R.....Cannon Falls

HENNEPIN COUNTY MEDICAL SOCIETY

Regular meetings, first Monday each month, October through May
Annual meeting, October
Number of Members: 683

President
White, W. D.....Minneapolis

Secretary
Jones, W. R.....Minneapolis

Executive Secretary
Mr. J. H. Baker.....Minneapolis

Aagaard, G. N., Jr.....Minneapolis
Abramson, Milton.....Minneapolis
Adams, J. M.....Minneapolis
‡Alexander, H. A.....Minneapolis
‡Aling, C. A.....Minneapolis
Allen, H. W.....Minneapolis
Allison, R. G.....Minneapolis
Altnow, H. O.....Minneapolis
Andersen, A. G.....Minneapolis
Andersen, S. C.....Minneapolis
Anderson, D. D.....Minneapolis
‡Anderson, E. D.....Minneapolis
Anderson, E. R.....Minneapolis
Anderson, F. J.....Minneapolis
Anderson, J. K.....Minneapolis
Anderson, K. W.....Minneapolis
Anderson, P. A.....Minneapolis
‡Anderson, U. S.....Minneapolis
‡Andreassen, E. C.....Minneapolis
Andresen, K. D.....Minneapolis
*Andrus, F. C.....Minneapolis
‡Arey, S. L.....Excelsior
‡Arlander, C. E.....Minneapolis
Arling, L. S.....Minneapolis
‡Arling, P. A.....Minneapolis
Arnold, Ann W.....Minneapolis
Arnold, D. C.....Minneapolis
Arvidson, C. G.....Minneapolis
Aune, Martin.....Minneapolis
Aurand, W. H.....Minneapolis

Baken, M. P.....Minneapolis
Baker, A. B.....Minneapolis
Baker, A. T.....Minneapolis
Baker, E. L.....Minneapolis
Baker, Looe.....Minneapolis
‡Balkin, S. G.....Minneapolis
†Barber, J. P.....Minneapolis
‡Barr, R. N.....St. Paul
Barron, Moses.....Minneapolis
Bass, G. W.....Minneapolis
Baxter, S. H.....Minneapolis
Bayard, H. F.....Minneapolis
Beach, Northrop.....Minneapolis
†Beard, A. H.....Minneapolis
Becker, Arnetta M.....Minneapolis
‡Beckman, W. G.....Minneapolis
Bedford, E. W.....Minneapolis
†Bell, E. T.....Minneapolis
‡Belzer, M. S.....Minneapolis
Benesh, L. A.....Minneapolis
Benesh, N. G.....Minneapolis
Benjamin, A. E.....Minneapolis
‡Benjamin, E. G.....Minneapolis
‡Benjamin, H. G.....Minneapolis
Benn, F. G.....Minneapolis
Berger, A. G.....Minneapolis
‡Bergh, G. S.....Minneapolis
‡Berkwitz, N. J.....Minneapolis
‡Berman, Reuben.....Minneapolis
Bessesen, A. N., Jr.....Minneapolis
‡Bessesen, D. H.....Minneapolis
Bessesen, W. A.....Minneapolis
Blake, James.....Hopkins
‡Blake, J. A.....Hopkins
Blumenthal, J. S.....Minneapolis
‡Blumstein, Alex.....Minneapolis
Bockman, M. W. H.....Minneapolis
Boehme, E. J.....Boston, Mass.
Boehrer, J. J.....Minneapolis
Boies, L. R.....Minneapolis
Booth, A. E.....Minneapolis
Boreen, C. A.....Minneapolis
Borgeson, E. J.....Minneapolis
Borman, C. N.....Minneapolis
Borowicz, L. A.....Minneapolis
†Bouman, H. A. H.....Minneapolis
Boynton, Ruth E.....Minneapolis
Bratrud, A. F.....Minneapolis
‡Brekke, H. J.....Minneapolis
Brooks, C. N.....Minneapolis
†Brown, E. D.....Paynesville
‡Brown, S. P.....Minneapolis
Brown, W. D.....Minneapolis
‡Brutsch, G. C.....Minneapolis
Bryant, F. L.....Minneapolis
‡Buchstein, H. F.....Minneapolis
Bulkley, Kenneth.....Minneapolis
‡Burlingame, D. A.....Minneapolis
Butler, John.....Minneapolis
Buzzelle, L. K.....Minneapolis
Cable, M. L.....Minneapolis
Cabot, C. M.....Minneapolis
Cabot, V. S.....Minneapolis
Cady, L. H.....Minneapolis
Callerstrom, G. W.....Minneapolis
Cameron, Isabell L.....Minneapolis
Camp, W. E.....Minneapolis
Campbell, L. M.....Minneapolis
Campbell, O. J.....Minneapolis
Cardle, A. E.....Minneapolis
Carey, J. B.....Minneapolis
Carlson, Lawrence.....Minneapolis
Carlson, L. T.....Minneapolis
Caron, R. P.....Minneapolis
‡Caspers, C. G.....Minneapolis
‡Cavanor, F. T.....Minneapolis
‡Challman, S. A.....Minneapolis
Chesley, A. J.....Minneapolis
Christenson, G. R.....Minneapolis
Christianson, H. W.....Minneapolis
†Clark, H. S.....Minneapolis
‡Clay, L. B.....Minneapolis
‡Cochrane, R. F.....Minneapolis
Cohen, S. S.....Oak Terrace
‡Colp, E. A.....Robbinsdale
Condit, W. H.....Minneapolis
Cooperman, H. O.....Minneapolis
Corbett, J. F.....Minneapolis
Corniea, A. D.....Minneapolis
Cranmer, R. R.....Minneapolis
‡Cranston, R. W.....Minneapolis
Creevy, C. D.....Minneapolis
‡Creighton, R. H.....Minneapolis
Cumming, H. A.....Minneapolis
Curtin, J. F.....Minneapolis
Cutts, George.....Minneapolis
Dady, E. E.....Minneapolis
Dahl, E. O.....Minneapolis
Dahl, J. A.....Minneapolis
Daniel, D. H.....Minneapolis
Daniel, L. M.....Minneapolis
Davis, J. C.....Minneapolis
del Plaine, C. W.....Minneapolis
Dennis, Clarence.....Minneapolis
Devereaux, T. J.....Wayzata
Diehl, H. S.....Minneapolis
Diessner, H. D.....Minneapolis
Dorge, R. I.....Minneapolis
Dornblaser, H. B.....Minneapolis
Dorsey, G. C.....Minneapolis
‡Dowidat, R. W.....Minneapolis
Doxey, G. L.....Minneapolis
Doyle, L. O.....Minneapolis
Drake, C. R.....Minneapolis
Drill, H. E.....Hopkins
Duff, E. R.....Minneapolis

Dukelow, D. A.....Minneapolis
Dumas, A. G.....Minneapolis
Dunlap, E. H.....Minneapolis
Dunn, G. R.....Minneapolis
Duryea, W. M.....Minneapolis
†Dutton, C. E.....Minneapolis
Dvorak, B. A.....Minneapolis
Dwan, P. F.....Minneapolis
Dworsky, S. D.....Minneapolis

Ehrenberg, C. J.....Minneapolis
Ehrlich, S. P.....Minneapolis
Eich, Matthew.....Minneapolis
Eisenstadt, D. H.....Minneapolis
‡Eisenstadt, W. S.....Minneapolis
Eitel, G. D.....Minneapolis
Ellison, D. E.....Minneapolis
Engelhart, P. C.....Minneapolis
Engstrand, O. J.....Minneapolis
‡Erickson, R. F.....Minneapolis
Ericson, R. M.....Minneapolis
‡Evans, E. T.....Minneapolis
Evans, R. D.....Minneapolis

Fahr, G. E.....Minneapolis
Fansler, W. A.....Minneapolis
‡Farsht, I. J.....Minneapolis
Feeney, J. M.....Minneapolis
Fenger, E. P. K.....Oak Terrace
Fetterly, Warren.....Minneapolis
Fink, L. W.....Minneapolis
Fink, W. H.....Minneapolis
†Fitzgerald, D. F.....Minneapolis
Fjeldstad, C. A.....Minneapolis
Fleming, A. S.....Minneapolis
Foker, L. W.....Minneapolis
Ford, W. H.....Minneapolis
Foster, W. K.....Minneapolis
‡Fowler, L. H.....Minneapolis
Frane, D. B. .....Minneapoils
Fredericks, G. M.....Minneapolis
Fredlund, M. L.....Minneapolis
Friedell, Aaron.....Minneapolis
‡Fritzell, K. E.....Minneapolis
Frost, J. B.....Minneapolis
Fuller, Alice H.....Minneapolis
‡Funk, V. K.....Oak Terrace

‡Galloway, J. B.....Minneapolis
Gammell, J. H.....Minneapolis
Gardner, E. L.....Minneapolis
‡Garten, J. L.....Minneapolis
Giere, J. C.....Minneapolis
Giere, R. W.....Minneapolis
†Giessler, P. W.....Minneapolis
Gilbert, Harry .....Minneapolis
Gilbert, M. G.....Minneapolis
Gilles, F. L.....Minneapolis
Gingold, B. A.....Minneapolis
Girvin, R. B.....Minneapolis
Golberg, M. L.....Minneapolis
Goldberg, I. M.....Minneapolis
Goldman, T. I.....Minneapolis
‡Goldner, M. Z.....Minneapolis
Good, H. D.....Minneapolis
Gordon, P. E.....Minneapolis
Grave, Floyd.....Minneapolis
‡Greathouse, J. D.....Minneapolis
Green, R. G.....Minneapolis
Grimes, Marian.....Minneapolis
Gronvall, P. R.....Minneapolis
Gunderson, N. A.....Minneapolis
Gushurst, E. G.....Minneapolis
Gustason, H. T.....Minneapolis

†Hacking, F. H.....Minneapolis
‡Hagen, W. S.....Minneapolis
†Haggard, G. D.....Minneapolis
Hall, H. B.....Minneapolis
Hall, J. M.....Minneapolis
Hallberg, C. A.....Minneapolis
‡Hallock, Philip.....Minneapolis
Hamel, A. L.....Minneapolis
Hamlin, G. B.....Minneapolis
‡Hammerstad, L. M.....Minneapolis
Hammond, A. J.....Minneapolis
Hannah, H. B.....Minneapolis
Hansen, C. O.....Minneapolis
Hansen, E. W.....Minneapolis
Hansen, Olga S.....Minneapolis
Hanson, H. J.....Minneapolis
Hanson, H. V.....Minneapolis
Hanson, M. B.....Minneapolis
Hanson, W. A.....Minneapolis
Happe, L. J.....Minneapolis
Harrington, C. D.....Wayzata
Harrington, F. E.....Minneapolis
‡Hart, V. I.....Minneapolis
†Hartzell, T. B.....Minneapolis
Hastings, D. R.....Minneapolis
‡Hauge, E. T.....Minneapolis
‡Haugen, J. A.....Minneapolis
Haven, W. K.....Minneapolis
*Haverfield, Addie R.....Minneapolis

‡Hawkinson, R. P.....Minneapolis
Hayes, J. M.....Minneapolis
Hays, A. T.....Minneapolis
‡Head, D. P.....Minneapolis
Head, G. D.....Minneapolis
Hedback, A. E.....Minneapolis
Heim, R. R.....Minneapolis
Hendrickson, J. F.....Minneapolis
Henrikson, E. C.....Minneapolis
†Henry, C. E.....Kirksville, Mo.
Henry, M. O.....Minneapolis
Herbert, W. L.....Minneapolis
Hertzog, A. J.....Minneapolis
Higgins, G. K.....Oak Terrace
Higgins, J. H.....Minneapolis
Hill, Eleanor J.....Minneapolis
Hillis, S. J.....Minneapolis
Hinckley, R. G.....Minneapolis
*Hirschfelder, A. D.....Minneapolis
Hirshfield, F. R.....Minneapolis
Hoaglund, A. W.....Minneapolis
†Hobbs, C. A.....Minneapolis
Hodge, S. V.....Minneapolis
Hoffbauer, F. W.....Minneapolis
Hoffert, H. E.....Minneapolis
Hoffman, R. A.....Minneapolis
Hoffman, W. L.....Minneapolis
†Holl, P. M.....Minneapolis
‡Holmberg, C. J.....Minneapolis
Holt, W. B.....Minneapolis
Holzapfel, F. C.....Minneapolis
Houkom, Bjarne.....Minneapolis
‡Hovland, M. L.....Minneapolis
Hudson, G. E.....Minneapolis
Huenekens, E. J.....Minneapolis
Hultkrans, J. C.....Minneapolis
Hultkrans, R. E.....Minneapolis
Hurd, Annah.....Minneapolis
‡Hutchinson, C. J.....Minneapolis
Hutchinson, Dorothy W....Oak Terrace
Hymes, Charles.....Minneapolis
Hynes, J. E.....Minneapolis

Irvine, H. G.....Minneapolis

†Jackson, C. M.....Minneapolis
‡Jaeck, J. L.....Minneapolis
Jennings, Mary H...Los Angeles, Calif.
Jensen, Harry.....Minneapolis
Jensen, R. A.....Minneapolis
Johnson, A. B.....Minneapolis
Johnson, A. E.....Minneapolis
Johnson, Evelyn V...St. Louis Park
‡Johnson, E. W.....Minneapolis
Johnson, H. A.....Minneapolis
Johnson, J. A.....Minneapolis
Johnson, Julius.....Minneapolis
†Johnson, N. A...Santa Monica, Calif.
Johnson, Norman.....Minneapolis
Johnson, N. T.....Minneapolis
Johnson, R. A.....Minneapolis
‡Johnson, R. E.....Minneapolis
‡Johnson, Y. T.....Minneapolis
‡Jones, H. W., Jr.....Minneapolis
Jones, W. R.....Minneapolis
Josewich, Alexander.....Minneapolis
Judd, W. H.....Minneapolis
Jurdy, M. J.....Minneapolis

Kalin, O. T.....Minneapolis
Karlstrom, A. E.....Minneapolis
Kelby, G. M.....Minneapolis
Kennedy, C. C.....Minneapolis
Kennedy, Jane F.....Minneapolis
Kerkhof, A. C.....Minneapolis
Kertesz, G.....Minneapolis
Kibbe, O. A.....Minneapolis
†King, E. A.....Minneapolis
King, Frances W.....Oak Terrace
King, H. T.....Minneapolis
Kinsella, T. J.....Minneapolis
Kistler, A. J.....Minneapolis
Kistler, C. M.....Minneapolis
Knight, R. R.....Minneapolis
Knight, R. T.....Minneapolis
Knapp, M. E.....Minneapolis
Koepcke, G. M.....Minneapolis
Koller, H. M.....Minneapolis
Koller, L. R.....Minneapolis
Korchik, J. P.....Minneapolis
Koucky, R. W.....Minneapolis
Kucera, F. J.....Hopkins
Kucera, W. J.....Minneapolis

Lajoie, J. M.....Minneapolis
Lang, L. A.....Minneapolis
Lapierre, A. P.....Minneapolis
Lapierre, J. T.....Minneapolis
‡Larsen, F. W.....Minneapolis
Larson, C. M.....Minneapolis
‡Larson, Lawrence M.....Minneapolis
Larson, Leonard M.....Oak Terrace
Larson, P. N.....Minneapolis
La Vake, R. T.....Minneapolis

Laymon, C. W.....Minneapolis
Lazar, H. L.....Minneapolis
†Leavitt, H. H.....Minneapolis
Lebowske, J. A.....Minneapolis
Lee, H. M.....Minneapolis
Leland, H. R.....Minneapolis
‡Leland, J. A. C.....Minneapolis
Lenz, O. A.....Minneapolis
Leonard, L. J.....Minneapolis
Leonard, Sam.....Minneapolis
Lillehei, E. J.....Robbinsdale
Lind, C. J.....Minneapolis
Lindberg, A. C.....Minneapolis
‡Lindberg, V. L.....Minneapolis
‡Lindgren, R. C.....Minneapolis
Lindquist, R. H.....Minneapolis
Linner, H. P.....Minneapolis
*Linton, W. B.....Minneapolis
‡Lippman, E. S.....Minneapolis
‡Lipschultz, Oscar.....Minneapolis
Litchfield, J. T.....Minneapolis
‡Litman, A. B.....Minneapolis
Litzenberg, J. C.....Minneapolis
Logefeil, R. C.....Minneapolis
†Long, Jesse.....Minneapolis
Loomis, E. A.....Minneapolis
Lovett, Beatrice R.....Oak Terrace
Lowry, Elizabeth C.....Minneapolis
Lowry, Thomas .....Minneapolis
‡Lufkin, N. H.....Minneapolis
Lundberg, Ruth I.....Minneapolis
‡Lundblad, R. A.....Minneapolis
‡Lundblad, S. W.....Minneapolis
Lundgren, A. C.....Minneapolis
Lundgren, Olive A.....Oakland, Calif.
Lundquist, E. F.....Minneapolis
Lynch, M. J.....Minneapolis
Lysne, Henry.....Minneapolis
‡Lysne, Myron.....Minneapolis

MacDonald, A. E.....Minneapolis
MacDonald, D. A.....Minneapolis
Mach, F. B.....Minneapolis
MacKinnon, D. C.....Minneapolis
Macnie, J. S.....Minneapolis
Maeder, E. C.....Minneapolis
Maland, C. O.....Minneapolis
Mariette, E. S.....Oak Terrace
Mark, D. B.....Minneapolis
Marking, G. H.....Osseo
Martinson, C. J.....Wayzata
†Matchan, G. R.....Minneapolis
Matthews, Justus.....Minneapolis
Mattill, P. M.....Oak Terrace
‡Mattison, R. E.....Minneapolis
Mattson, Hamlin.....Minneapolis
Maxeiner, S. R.....Minneapolis
May, W. H.....Minneapolis
‡McCarthy, Donald .....Minneapolis
McCartney, J. S.....Minneapolis
‡McCrimmon, H. P.....Minneapolis
McDaniel, Orianna.....Minneapolis
McFarland, A. H.....Minneapolis
McGandy, R. F.....Minneapolis
McGeary, G. E.....Minneapolis
McInerny, M. W.....Minneapolis
McKelvey, J. L.....Minneapolis
McKenzie, C. H.....Minneapolis
McKinlay, C. A.....Minneapolis
McKinley, J. C.....Minneapolis
McKinney, F. S.....Minneapolis
McLennan, C. E.....Minneapolis
McPheeters, H. O.....Minneapolis
†McQuarrie, Irvine.....Minneapolis
Meland, E. L.....Minneapolis
Meller, R. L.....Minneapolis
Merkert, C. E.....Minneapolis
Merkert, G. L.....Minneapolis
†Merrill, Elisabeth .....Minneapolis
Meyer, A. J.....Minneapolis
Meyer, E. L.....Minneapolis
Michael, J. C.....Minneapolis
‡Michel, H. H.....Minneapolis
Michelson, H. E.....Minneapolis
‡Miller, Harold E.....Minneapolis
‡Miller, Hugo E.....Minneapolis
Miller, J. C.....Minneapolis
Milton, J. S.....Minneapolis
Minsky, A. A.....Minneapolis
Mitchell, E. C.....Mound
Moe, J. H.....Minneapolis
Moen, J. K.....Minneapolis
‡Monson, E. M.....Minneapolis
Moren, Edward.....Minneapolis
Moriarty, Cecile R.....St. Paul
Morrison, A. W.....Minneapolis
Morrison, Charlotte J.....Minneapolis
Morse, R. W.....Minneapolis
‡Murphy, E. P.....Minneapolis
Murphy, I. J.....Minneapolis
‡Musty, N. J.....Minneapolis
Myers, J. A.....Minneapolis

‡Naslund, A. W.....Minneapolis

Neal, J. M.....Minneapolis
Neary, R. P.....Minneapolis
†Nelson, H. S.....Excelsior
Nelson, E. N.....Minneapolis
Nelson, Harvey.....Minneapolis
‡Nelson, L. M.....Minneapolis
‡Nelson, M. C.....Minneapolis
‡Nelson, O. L. N.....Minneapolis
Nelson, W. I.....Minneapolis
Newhart, Horace.....Minneapolis
‡Noonan, W. J.....Minneapolis
Nordin, G. T.....Minneapolis
Nordland, Martin.....Minneapolis
Noth, H. W.....Minneapolis
Nydahl, M. J.....St. Paul
Nylander, E. G.....Minneapolis

Oberg, C. M.....Minneapolis
†O'Brien, W. A.....Minneapolis
O'Donnell, J. E.....Minneapolis
Olsen, E. G.....Minneapolis
Olson, A. C.....Minneapolis
Olson, F. A.....Minneapolis
Olson, O. A.....Minneapolis
†Olson, R. G.....Minneapolis
Oppen, E. G.....Minneapolis
Owre, Oscar.....Minneapolis

‡Paine, J. R.....Minneapolis
‡Palen, B. J.....Minneapolis
Patterson, W. E.....Minneapolis
†Pederson, R. M.....Minneapolis
Peppard, T. A.....Minneapolis
‡Perlman, E. C.....Minneapolis
Petersen, J. R.....Minneapolis
‡Petersen, R. T.....Minneapolis
Petersen, Thorvald.....Minneapolis
Peterson, Henry.....Minneapolis
Peterson, H. W.....Minneapolis
Peterson, N. P.....Minneapolis
Peterson, O. H.....Minneapolis
Peterson, P. E.....Minneapolis
Peterson, W. C.....Minneapolis
Petit, L. J.....Minneapolis
‡Pewters, J. T.....Minneapolis
Peyton, W. T.....Minneapolis
Pfunder, M. C.....Minneapolis
Phelps, K. A.....Minneapolis
Platou, E. S.....Minneapolis
Pohl, J. F.....Minneapolis
‡Pollard, D. W.....Minneapolis
Pollock, D. K.....Minneapolis
Polzak, J. A.....Minneapolis
Poppe, F. H.....Minneapolis
Potter, R. B.....Minneapolis
Potthoff, C. J.....Minneapolis
Pratt, F. J.....Minneapolis
Preine, I. A.....Minneapolis
Preston, P. J.....Minneapolis
‡Priest, R. E.....Minneapolis
Prim, J. A.....Minneapolis
Proffitt, W. E.....Minneapolis
Proshek, C. E.....Minneapolis

‡Quello, R. O. B.....Minneapolis
†Quinby, T. F.....Minneapolis
Quist, H. W.....Minneapolis

Reed, C. A.....Minneapolis
Regnier, E. A.....Minneapolis
‡Rewbridge, A. G.....Minneapolis
Reynolds, J. S.....Minneapolis
Rice, C. O.....Minneapolis
‡Richardson, F. S.....Minneapolis
Richdorf, L. F.....Minneapolis
Rieke, W. W.....Wayzata
Rigler, L. G.....Minneapolis
Risch, R. E.....Minneapolis
‡Rizer, D. K.....Minneapolis
Rizer, R. I.....Minneapolis
Roan, C. M.....Minneapolis
Robb, E. F.....Minneapolis
Robbins, O. F.....Minneapolis
‡Roberts, L. J.....Minneapolis
‡Roberts, S. W.....Minneapolis
Roberts, T. S.....Minneapolis
Roberts, W. B.....Minneapolis
Robitshek, E. C.....Minneapolis
Rochford, W. E.....Minneapolis
Rodda, F. C.....Minneapolis
Rosen, Samuel.....Minneapolis
Rosenwald, R. M.....Minneapolis
Roskilly, G. C. P.....Minneapolis
‡Ross, A. J.....Minneapolis
Rucker, W. H.....Minneapolis
Rud, N. E.....Minneapolis
Rudell, G. L.....Minneapolis
‡Russeth, A. N.....Minneapolis
Rusten, E. M.....Minneapolis

‡Sadler, W. P.....Minneapolis
‡St. Cyr, K. J.....Osseo
Saliterman, B. I.....Minneapolis
Salt, C. G.....Minneapolis
Samuelson, Samuel.....Minneapolis
Sandell, S. T.....Oak Terrace
‡Sandt, K. E.....Minneapolis
Sawatzky, W. A.....Minneapolis
Schaaf, F. H. K.....Minneapolis
Schaefer, W. G.....Minneapolis
†Scheldrup, N. H.....Minneapolis
Scherer, L. R.....Minneapolis
Schiele, B. C.....Minneapolis
‡Schmidt, G. F.....Minneapolis
†Schmitt, A. F.....Minneapolis
†Schmitt, S. C.....Los Angeles, Calif.
†Schneider, J. P.....Minneapolis
Schneidman, N. R.....Minneapolis
Schottler, M. E.....Minneapolis
Schultz, P. J.....Minneapolis
†Schussler, O. F.....Minneapolis
Schwartz, V. J.....Minneapolis
†Schwyzer, Gustav.....Minneapolis
†Scott, F. H.....Minneapolis
Scott, H. G.....Minneapolis
Seashore, Gilbert.....Minneapolis
Seham, Max.....Minneapolis
Seifert, M. H.....Excelsior
‡Seljeskog, S. R.....Minneapolis
Shaperman, Eva P.....Minneapolis
Shapiro, M. J.....Minneapolis
Sharp, D. V.....Minneapolis
Siegmann, W. C.....Minneapolis
Silver, J. D.....Minneapolis
Simons, J. H.....Minneapolis
‡Simonson, D. B.....Minneapolis
Simpson, E. D.....Minneapolis
‡Sinykin, M. B.....Minneapolis
Siperstein, D. M.....Minneapolis
†Sivertsen, Andrew.....Excelsior
Sivertsen, Ivar.....Minneapolis
Skjold, A. C.....Minneapolis
‡Sloan, Julius.....Minneapolis
Smisek, F. M.....Minneapolis
Smith, A. E.....Minneapolis
Smith, Adam M.....Minneapolis
Smith, Archie M.....Minneapolis
Smith, H. R.....Minneapolis
Smith, Margaret I.....Minneapolis
Smith, N. M.....Minneapolis
Soderlind, R. T.....Minneapolis
Solhaug, S. B.....Minneapolis
‡Spano, J. P.....Minneapolis
‡Sperling, Louis.....Minneapolis
Spink, W. W.....Minneapolis
Spratt, C. N.....Minneapolis
Stanford, C. E.....Minneapolis
‡Stebbins, T. L.....Minneapolis
Stein, K. E.....Lakeville
Stelter, L. A.....Minneapolis
Stenstrom, Annette T.....Minneapolis
Stewart, R. I.....Minneapolis
Stoesser, A. V.....Minneapolis
†Stomel, Joseph...Los Angeles, Calif.
Strachauer, A. C.....Minneapolis
‡Stromgren, D. T.....Minneapolis
Strout, G. E.....Minneapolis
Sturre, J. R.....Minneapolis
Stuurmans, S. H.....Minneapolis
Sullivan, R. M.....Minneapolis
‡Sullivan, R. R.....Minneapolis
Sundt, Mathias.....Minneapolis
Swanson, Cephas.....Minneapolis
Swanson, R. E.....Minneapolis
‡Sweetser, H. B., Jr.....Minneapolis
†Sweetser, H. B., Sr.....Minneapolis
Sweetser, T. H.....Minneapolis
Sweitzer, S. E.....Minneapolis
†Swendseen, C. G.....Minneapolis

Tangen, G. M.....Minneapolis
Taylor, J. H.....Minneapolis
Thomas, G. E.....Minneapolis
Thomas, G. H.....Minneapolis
Thomas, G. J.....Minneapolis
Thompson, W. H.....Minneapolis
Thysell, D. M.....Minneapolis
Tingdale, A. C.....Minneapolis
Todd, Ramona L.....Minneapolis
‡Trow, J. E.....Minneapolis
Trueman, H. S.....Minneapolis
Tunstead, H. J.....Minneapolis
Turnacliff, D. D.....Minneapolis

Ude, W. H.....Minneapolis
Ulrich, H. L.....Minneapolis
Undine, C. A.....Minneapolis

Vik, A. E.....Minneapolis

Wahlquist, H. F.....Minneapolis
Walch, A. E.....Minneapolis
Waldron, C. W.....Minneapolis
Wall, C. R.....Minneapolis
‡Walsh, W. T.....Minneapolis
Wangensteen, O. H.....Minneapolis
†Wanous, E. Z.....Minneapolis
†Ward, A. W.....Minneapolis
Ward, P. A.....Minneapolis
Watson, C. J.....Minneapolis
Webb, R. C.....Minneapolis
‡Weisman, S. A.....Minneapolis
West, Catherine C.....Minneapolis
Wethall, A. G.....Minneapolis
Wetherby, Macnider.....Minneapolis
Weum, T. W.....Minneapolis
White, A. A.....Minneapolis
White, S. M.....Minneapolis
White, W. D.....Minneapolis
Whitesell, L. A.....Minneapolis
‡Widen, W. F.....Minneapolis
Wilcox, A. E.....Minneapolis
‡Wildebush, F. F.....Minneapolis
Wilder, K. W.....Minneapolis
Wilder, R. L.....Minneapolis
Wilken, P. A.....Minneapolis
Williams, Robert.....Minneapolis
Winer, L. H.....Minneapolis
Winther, Nora M. C.....Minneapolis
‡Wipperman, F. F.....Minneapolis
Witham, C. A.....Minneapolis
Wittich, F. W.....Minneapolis
Wohlrabe, A. A.....Minneapolis
Woodworth, Elizabeth.....Minneapolis
†Wright, C. D.....Minneapolis
Wright, S. G.....Minneapolis
Wright, W. S.....Minneapolis
Wyatt, O. S.....Minneapolis
Wynne, H. M. N.....Minneapolis

Ylvisaker, R. S.....Minneapolis
Yoerg, O. W.....Minneapolis

Zaworski, E. A.....Minneapolis
Zierold, A. A.....Minneapolis
Zinter, F. A.....Minneapolis
Ziskin, Thomas.....Minneapolis

KANDIYOHI-SWIFT-MEEKER COUNTY MEDICAL SOCIETY

Regular meetings, second Wednesday of month

Annual meeting, January

Number of Members: 34

President

Frisch, F. P.....Willmar

Secretary

Frost, E. H.....Willmar

Anderson, R. E.....Willmar
Arnson, J. M.....Benson
‡Beckjord, P. R.....Willmar
Branton, A. F.....Willmar
Branton, B. J.....Willmar
Brigham, Frank.....Watkins
Danielson, K. A.....Litchfield
Danielson, Lennox.....Litchfield
Dowswell, W. J.....Kerkhoven
‡Feinstein, J. Y.....Grove City
Frederickson, Alice C.....Willmar
Frederickson, G. U. Y.....Willmar
Frisch, F. P.....Willmar
Frost, E. H.....Willmar
Giere, S. W.....Benson
‡Gilman, L. C.....Atwater
Hodapp, R. J.....Willmar
‡Jacobs, D. L.....Willmar
Jacobs, J. C.....Willmar
Johnson, Hans.....Kerkhoven
‡Johnson, J. W.....Kerkhoven
Kaufman, E. J.....Appleton
Macklin, W. E.....Litchfield
Marsh, O. M.....Litchfield
‡Mattson, A. D.....Atwater
Petersen, M. C.....Rochester
‡Proeschel, R. K.....Willmar
Ripple, R. J.....New London
Scofield, C. L.....Benson
‡Sellers, G. K.....Dassel
Solsem, F. N.....Spicer
Telford, V. J.....Litchfield
‡Wilmot, C. A.....Litchfield
Wilmot, H. E.....Litchfield

LYON-LINCOLN COUNTY MEDICAL SOCIETY

Regular meetings, first Tuesday of month
Annual meeting, Last Tuesday in October
Number of Members: 26

President
George Friedell ..... Ivanhoe

Secretary
Workman, W. G. ..... Tracy

Akester, Ward ..... Marshall
‡Erickson, A. O. ..... Ivanhoe
Ford, B. C. ..... Marshall
‡Frank, J. E. ..... Marshall
Friedell, George ..... Ivanhoe
Germo, Charles ..... Balaton
Gray, F. D. ..... Marshall
‡Gray, R. F. ..... Marshall
‡Helferty, J. K. ..... Tracy
Hermanson, P. E. ..... Hendricks
Hoidale, A. D. ..... Tracy
Johnson, P. C. ..... Tyler
‡Karleen, C. I. ..... Tracy
Kruezer, T. C. ..... Marshall
‡Monson, L. J. ..... Canby
‡Murphy, J. E. ..... Marshall
Purves, G. H. ..... Lake Benton
†Robertson, J. B. ..... Minneapolis
Sanderson, E. T. ..... Minneota
‡Smith, L. A. ..... Balaton
‡Thompson, C. O. ..... Hendricks
Vadheim, A. L. ..... Tyler
Valentine, W. H. ..... Tracy
Wolstan, S. D. ..... Minneota
Workman, W. G. ..... Tracy
Yaeger, W. W. ..... Marshall

McLEOD COUNTY MEDICAL SOCIETY

Regular meetings, at call of President
Annual meeting, January
Number of Members: 19

President
Goss, Martha D. ..... Glencoe

Secretary
Kallestad, L. L. ..... Hutchinson

Clement, J. B. ..... Lester Prairie
‡Goss, H. C. ..... Glencoe
Goss, Martha D. ..... Glencoe
Holm, H. H. ..... Glencoe
Jensen, A. M. ..... Brownton
Kallestad, L. L. ..... Hutchinson
Klima, W. W. ..... Stewart
Lippmann, E. W. ..... Hutchinson
McMahon, M. J. ..... Green Isle
Neumaier, Arthur ..... Glencoe
Rempel, D. D. ..... Lester Prairie
Sahr, W. G. ..... Hutchinson
Scholpp, O. W. ..... Hutchinson
Selmo, J. D. ..... Norwood
Sheppard, C. G. ..... Hutchinson
†Sheppard, Fred ..... Burien, Wash.
†Sheppard, P. E. ..... Hutchinson
†Tinker, C. W. ..... Stewart
Trutna, T. J. ..... Silver Lake

MOWER COUNTY MEDICAL SOCIETY

Regular meetings, last Thursday of each month
Annual meeting, November
Number of Members: 24

President
Morrow, J. J. ..... Austin

Secretary
Robertson, P. A. ..... Austin

Allen, C. C. ..... Austin
Allen, H. B. ..... Austin
‡Anderson, D. P., Jr. ..... Austin
Cronwell, B. J. ..... Austin
‡Eckdale, J. E. ..... Lyle
‡Eckhardt, C. L. ..... Austin
Grise, W. B. ..... Austin
Havens, J. G. W. ..... Austin
Hegge, O. H. ..... Austin
Hegge, R. S. ..... Austin
Henslin, A. E. ..... Le Roy
Hertel, G. E. ..... Austin
‡Leck, P. C. ..... Austin
Lommen, P. A. ..... Austin
McKenna, J. K. ..... Austin
Melzer, G. R. ..... Lyle
Mitchell, R. S. ..... Grand Meadow
Morrow, J. J. ..... Austin
Morse, M. P. ..... Le Roy
Robertson, P. A. ..... Austin
‡Rosenthal, F. H. ..... Grand Meadow
Schneider, P. J. ..... Adams
Schottler, G. J. ..... Dexter
Sheedy, C. L. ..... Austin

NICOLLET-LE SUEUR COUNTY MEDICAL SOCIETY

Annual meeting, December
Number of Members: 23

President
Nilson, H. J. ..... North Mankato

Secretary
Johnson, H. C. ..... North Mankato

Aitkens, H. B. ..... Le Center
Bloedel, T. J. ..... Glencoe
Covell, W. W. ..... St. Peter
Curtis, R. A. ..... Le Center
Ericson, Swan ..... Le Sueur
Freeman, G. H. ..... St. Peter
‡Grimes, B. P. ..... St. Peter
Hiniker, P. J. ..... Le Sueur
Holtan, Theodore ..... Waterville
Johnson, H. C. ..... North Mankato
Kolars, J. J. ..... Le Center
‡Larson, M. H. ..... Nicollet
‡Lenander, M. E. ..... St. Peter
Miller, E. W. ..... St. Peter
Nilson, H. J. ..... North Mankato
Olmanson, E. G. ..... St. Peter
Olson, D. C. ..... Gaylord
‡Sonnesyn, N. N. ..... Le Sueur
Strathern, C. S. ..... St. Peter
Strathern, F. P. ..... St. Peter
Traxler, F. J. ..... Henderson
Wohlrabe, C. F. ..... North Mankato
Wolner, O. H. ..... St. Peter
*Woodworth, L. F. ..... Le Center

OLMSTED-HOUSTON-FILLMORE-DODGE COUNTY MEDICAL SOCIETY

Regular meetings, first Wednesday every odd month
Annual meeting, November
Number of Members: 494

President
Smith, H. L. ..... Rochester

Secretary
Anderson, M. J. ..... Rochester

Adams, R. C. ..... Rochester
Adson, A. W. ..... Rochester
Affeldt, D. E. ..... Kasson
Ahlfs, Jacob ..... Caledonia
Aita, J. A. ..... Rochester
Albers, G. D. ..... Rochester
‡Allen, E. V. ..... Rochester
Alvarez, W. C. ..... Rochester
Amberg, Samuel ..... Rochester
‡Ambrusko, J. S. ..... Rochester
‡Anderson, B. M. ..... Rochester
‡Anderson, C. D. ..... Rochester
‡Anderson, E. M. ..... Rochester
Anderson, L. E. ..... Rochester
Anderson, M. J. ..... Rochester
Anderson, N. E. ..... Harmony
Arny, F. P. ..... Preston
‡Ashburn, F. S. ..... Rochester
Atwater, J. S. ..... Rochester
‡Babb, F. S. ..... Rochester
Baggenstoss, A. H. ..... Rochester
Bair, H. L. ..... Rochester
‡Baker, G. S. ..... Rochester
Baker, H. R. ..... Hayfield
Baker, R. L. ..... Hayfield
Balfour, D. C. ..... Rochester
Banner, E. A. ..... Rochester
Bargen, J. A. ..... Rochester
Barker, N. W. ..... Rochester
Barnes, A. R. ..... Rochester
Barton, R. L. ..... Rochester
Beard, Crowell ..... Rochester
Beizer, L. H. ..... Rochester
Belote, G. B. ..... Caledonia
Benedict, W. L. ..... Rochester
‡Bennett, J. K. ..... Rochester
Bennett, W. A. ..... Rochester
Benson, R. E. ..... Rochester
Berkman, D. M. ..... Rochester
Berkman, J. M. ..... Rochester
Bickel, W. H. ..... Rochester
Bigelow, C. E. ..... Dodge Center
Binger, M. W. ..... Rochester
Black, A. S., Jr. ..... Rochester
Black, B. M. ..... Rochester
Blaisdell, J. S. ..... Rochester
Blumenthal, L. S. ..... Rochester
Boothby, W. M. ..... Rochester
Bowing, H. H. ..... Rochester
Braasch, W. F. ..... Rochester
Bradshaw, S. P. ..... Rochester
Breslow, Lester ..... Rochester
Brindley, G. V., Jr. ..... Rochester
Broders, A. C. ..... Rochester
Brown, A. E. ..... Rochester
Brown, H. A. ..... Rochester
Brown, J. R. ..... Rochester
‡Brown, M. H. ..... Rochester
‡Brown, P. W. ..... Rochester
Browne, H. C., Jr. ..... Rochester
Brunsting, L. A. ..... Rochester
Bryson, J. C. ..... Rochester
‡Buck, R. M. ..... Rochester
Buie, L. A. ..... Rochester
‡Burchell, H. B. ..... Rochester
Burdon, Phyllis J. ..... Rochester
Burkhart, R. J. ..... Rochester
‡Butt, H. R. ..... Rochester
‡Caldwell, H. W. ..... Rochester
Call, J. D. ..... Rochester
‡Camp, J. D. ..... Rochester
‡Campbell, C. M. ..... Rochester
‡Campbell, D. C. ..... Rochester
‡Campbell, J. R. ..... Rochester
Canfield, W. W. ..... Houston
Carmona, M. G. ..... Rochester
Carryer, H. M. ..... Rochester
Ceder, E. T. ..... Rochester
Chapman, A. S. ..... Rochester
Christensen, B. H. ..... Rochester
Clagett, O. T. ..... Rochester
Clark, L. W. ..... Spring Valley
‡Clarke, E. T. ..... Rochester
Clifton, T. A. ..... Chatfield
Comfort, M. W. ..... Rochester
‡Condon, W. B. ..... Rochester
†Conner, H. M. ..... Rochester
Cook, E. N. ..... Rochester
‡Cooper, Talbert ..... Rochester
Cooper, W. L. ..... Rochester
Corbitt, R. W. ..... Rochester
Counseller, V. S. ..... Rochester
‡Coventry, M. B. ..... Rochester
‡Cragg, R. W. ..... Rochester
‡Craig, W. McK. ..... Rochester
Crenshaw, J. L. ..... Rochester
Crewe, J. E. ..... Rochester

‡Cummings, D. W.....Rushford
‡Cunningham, B. P.....Rochester
‡Cusick, P. L.....Rochester
Dahleen, H. C.....Rochester
Darling, J. P.....Rochester
Daugherty, G. W.....Rochester
Davies, L. T.....Rochester
Davis, A. C.....Rochester
Davis, I. G.....Rushford
Day, Lois.....Rochester
Dearing, W. H.....Rochester
‡Demong, C. V.....Rochester
Desjardins, A. U.....Rochester
Dixon, C. F.....Rochester
Dobyns, B. M.....Rochester
Dochat, G. R.....Rochester
Dockerty, M. B.....Rochester
Downing, G. C.....Rochester
†Drake, F. A.....Lanesboro
‡Drapiewski, J. F.....Rochester
Drips, Della G.....Rochester
‡Dry, T. J.....Rochester
Dunlap, D. L.....Rochester

Eaton, L. McK.....Rochester
‡Egan, Sherman.....Rochester
Ehni, G. J.....Rochester
Elkins, E. C.....Rochester
‡Emerson, G. F.....Rochester
Emmett, J. L.....Rochester
Erich, J. B.....Rochester
‡Erickson, C. O.....Rochester
Erickson, D. J.....Rochester
Erickson, E. W.....Rochester
Evans, C. H., Jr.....Rochester
†Evarts, A. B.....Rochester
Eusterman, G. B.....Rochester

Faber, J. E.....Rochester
Faber, W. M.....Rochester
Fahlund, G. T. R.....Rochester
Fawcett, R. M.....Rochester
Feldman, F. M.....Rochester
‡Ferguson, F. F.....Detroit, Mich.
‡Ferguson, W. J., Jr.....Rochester
Ferris, D. O.....Rochester
Figi, F. A.....Rochester
Fischer, Albert.....Rochester
‡Flinn, J. H.....Rochester
Foerster, J. M.....Rochester
Fogarty, C. W., Jr.....Rochester
‡Forney, R. A.....Rochester
Foss, E. L.....Rochester
‡Foster, M. A.....Rochester
Foster, T. N.....Rochester
Fricke, R. E.....Rochester

Gaarde, F. W.....Rochester
Gambill, E. E.....Rochester
Gelbach, P. D.....Rochester
Ghormley, R. K.....Rochester
‡Giffin, H. M.....Rochester
Giffin, H. Z.....Rochester
‡Gillespie, D. R.....Rochester
Glenn, D. L.....Rochester
Glomset, D. A.....Rochester
Glover, R. P.....Rochester
Good, C. A., Jr.....Rochester
‡Gore, H. R.....Rochester
Gorsuch, M. T.....Rochester
‡Graham, F. M.....Rochester
‡Graham, R. J.....Rochester
‡Gray, H. K.....Rochester
Greene, L. F.....Rochester
‡Guernsey, D. E.....Rochester
Guthrie, R. F.....Rochester

Habein, H. C.....Rochester
Haines, S. F.....Rochester
‡Haisten, A. S.....Rochester
Hall, B. E.....Rochester
Hallberg, O. E.....Rochester
Hallenbeck, D. F.....Rochester
Hallenbeck, G. A.....Rochester
Hammes, E. M., Jr.....Rochester
Hanson, N. O.....Rochester
Hardman, Sue C.....Rochester
Hargraves, M. M.....Rochester
‡Harley, R. D.....Rochester
Harper, S. B.....Rochester
Harrington, S. W.....Rochester
Hartman, H. R.....Rochester
‡Harvey, George, Jr.....Rochester
Hausmann, P. F.....Rochester
Havens, F. Z.....Rochester
Hawkins, W. J.....Rochester
Heck, F. J.....Rochester
Heersema, P. H.....Rochester
Heilman, Charles.....Fargo, N. D.
Heilman, Dorothy M. H...Rochester
Heilman, F. R.....Rochester
Heinrich, W. A.....Rochester
Helland, G. M.....Spring Grove
Helland, J. W.....Spring Grove

Helmholz, H. F.....Rochester
Hempstead, B. E.....Rochester
‡Hench, P. S.....Rochester
Henderson, J. W.....Rochester
Henderson, M. S.....Rochester
Herbst, R. F.....Wykoff
Herrell, W. E.....Rochester
Hewitt, Edith S.....Rochester
†Hewitt, R. M.....Rochester
†Heyerdale, O. C.....Rochester
‡Heyerdale, W. W.....Rochester
‡Higginson, J. F.....Rochester
‡Hill, J. R.....Rochester
Hines, E. A., Jr.....Rochester
Hinshaw, H. C.....Rochester
Hoagland, P. I., Jr.....Rochester
Hodgson, Jane E.....Rochester
*Hopkins, E. O.....Rochester
Hopping, R. A.....Rochester
Horton, B. T.....Rochester
Howell, L. P.....Rochester
Hoyne, R. M.....Rochester
‡Hughes, T. J.....Rochester
Hunt, A. B.....Rochester
‡Hunter, O. B.....Rochester
Hurwitz, M. M.....Rochester

Iverson, H. A.....Rochester
Iverson, R. M.....Rochester
‡Ivie, J. McK.....Rochester

Jackman, R. J.....Rochester
Jacobson, C. E., Jr.....Rochester
‡Johnson, C. R.....Rochester
Johnson, H. P.....Harmony
Johnson, J. R.....Rochester
Johnson, R. B.....Lanesboro
‡Joss, C. S.....Rochester
Joyce, G. L.....Rochester
Judd, D. B.....Rochester
Judd, E. S.....Rochester
‡Jump, W. C.....Kasson

Kapernick, J. S.....Rochester
‡Kauvar, A. J.....Rochester
Keating, F. R., Jr.....Rochester
Keith, H. M.....Rochester
Keith, N. M.....Rochester
Kennedy, R. L. J.....Rochester
Kepler, E. J.....Rochester
Kernohan, J. W.....Rochester
‡Kierland, R. R.....Rochester
Kiernan, P. C.....Rochester
Kirklin, B. R.....Rochester
Kirklin, O. L.....Rochester
‡Klinkenberg, R. B.....Rochester
Kloos, E. K.....Rochester
Koelsche, G. A.....Rochester
‡Kreilkamp, B. L.....Rochester
Krusen, F. H.....Rochester
Kvale, W. F.....Rochester

Lander, H. H.....Rochester
Lannin, J. C.....Mabel
‡Large, H. R.....Rochester
‡Larrabee, W. F., Jr.....Rochester
Latchem, C. W.....Rochester
Leddy, E. T.....Rochester
‡Lehnhoff, H. J., Jr.....Rochester
Lemon, W. S.....Rochester
Levinson, J. P.....Rochester
Lichtman, A. L.....Rochester
‡Lien, R. J.....Rochester
Lillie, H. I.....Rochester
‡Lillie, J. C.....Rochester
‡Lindahl, W. W.....Rochester
‡Little, A. G.....Rochester
Lipscomb, P. R.....Rochester
†Lochead, D. C.....Rochester
Logan, A. H.....Rochester
Logan, G. B.....Rochester
Long, G. C.....Rochester
Love, J. G.....Rochester
‡Love, W. R.....Rochester
‡Lovelace, W. R.....Rochester
‡Lovelady, S. B.....Rochester
Lovering, Joseph.....Rochester
‡Lovshin, L. L.....Wausau, Wisc.
Luckey, C. A.....Rochester
Luden, Georgine..Victoria, B. C., Can.
‡Lueck, A. G.....Rochester
Lundy, J. S.....Rochester
Lynch, R. C.....Rochester

MacCarty, C. S.....Rochester
†MacCarty, W. C.....Rochester
‡Macey, H. B.....Rochester
‡MacKay, H. J.....Seattle, Wash.
‡MacLean, A. R.....Rochester
‡Magath, T. B.....Rochester
Manlove, F. R.....Rochester
†Mann, F. C.....Rochester
Manning, J. J.....Rochester
Marr, G. E.....Rochester
Martin, G. M.....Rochester

Marvin, C. P.....Rochester
Masson, D. M.....Rochester
Masson, J. C.....Rochester
‡Mayo, C. W.....Rochester
‡Maytum, C. K.....Rochester
McCall, C. H.....Rochester
McCallig, J. J.....Rochester
McCloud, C. N., Jr.....Rochester
McDonald, J. R.....Rochester
McEachern, C. G.....Rochester
McKaig, C. B.....Pine Island
McNairy, D. J.....Rochester
Merritt, W. A.....Rochester
Messler, J. D.....Rochester
Metcalfe, R. M.....Rochester
Meyer, W. C.....Rochester
Meyerding, H. W.....Rochester
Miller, J. R., Jr.....Rochester
Miller, R. C.....Rochester
Moersch, F. P.....Rochester
Moersch, H. J.....Rochester
Montgomery, Hamilton.....Rochester
Morlock, C. G.....Rochester
‡Mousel, L. H.....Rochester
Murphy, M. E.....Rochester
Murray, N. A.....Rochester
Murray, R. A.....Rochester
‡Musgrove, J. E.....Rochester
Mussey, Mary E.....Rochester
Mussey, R. D.....Rochester

Nass, H. A.....Mabel
Nay, R. M.....Rochester
Neel, R. M.....Rochester
Nehring, J. P.....Preston
Nester, H. D.....Rochester
New, G. B.....Rochester
Nichols, D. R.....Rochester
Norris, N. T.....Caledonia
Northrup, W. F., Jr.....Rochester

Odel, H. M.....Rochester
O'Leary, P. A.....Rochester
Olsen, A. M.....Rochester
Olson, E. A.....Pine Island
‡Olson, G. E.....West Concord
Olson, J. D.....Rochester
Olson, S. W.....Rochester
Onsgard, L. K.....Houston

Parker, R. L.....Rochester
Parkhill, Edith M.....Rochester
‡Pattison, D. H.....Rochester
‡Paulson, D. L.....Rochester
Paulson, J. A.....Rochester
Payne, J. H.....Rochester
Pearson, D. J.....Rochester
Pemberton, J. deJ.....Rochester
‡Pender, J. W.....Rochester
‡Pennington, R. E.....Rochester
‡Perry, T. T.....Rochester
Peters, G. A.....Rochester
‡Peterson, W. G.....Rochester
‡Phalen, G. S.....Rochester
Piper, M. C.....Rochester
‡Plimpton, N. C., Jr.....Rochester
Plummer, W. A.....Rochester
Polley, H. F.....Rochester
Pollock, L. W.....Rochester
Polmeteer, F. E.....Rochester
Pool, T. L.....Rochester
Popovich, S. J.....Rochester
Popp, W. C.....Rochester
Powers, F. H.....Rochester
Prangen, A. D.....Rochester
Pratt, J. H., Jr.....Rochester
*Preston, F. W.....Rochester
Preston, L. F.....Rochester
Prickman, L. E.....Rochester
Priestley, J. T.....Rochester
Proudfit, C. H.....Rochester
Pruitt, R. D.....Rochester
Pugh, D. G.....Rochester

Radcliffe, James, Jr.....Rochester
Randall, L. M.....Rochester
‡Rasmussen, W. C.....Rochester
Raszkowski, H. J.....Rochester
‡Richardson, R. J.....Rushford
Richardson, W. E.....Rushford
Rigos, F. J.....Rochester
Risser, A. F.....Stewartville
Rivers, A. B.....Rochester
Robertson, H. E.....Rochester
Robinson, F. J.....Rochester
‡Rogne, W. G.....Spring Grove
Root, G. T.....Rochester
Rosenow, E. C.....Rochester
Rosenow, J. H.....Rochester
Rucker, C. W.....Rochester
‡Rulison, E. T., Jr.....Rochester
Rushton, J. G.....Rochester
Russ, F. H.....Rochester
Ryan, B. F.....Rochester
Rynearson, E. H.....Rochester

Sanford, A. H.....Rochester
Sauer, W. G.....Rochester
‡Sayre, G. P.....Rochester
‡Scales, J. R.....Rochester
Scheetz, R. J.....Rochester
Scheifley, C. H.....Rochester
Schlicke, C. P.....Rochester
Schmidt, H. W.....Rochester
‡Schmitt, G. F., Jr.....Rochester
Schmitz, R. L.....Rochester
‡Schneider, H. H.....Kansas City, Mo.
Scholten, R. A.....Rochester
‡Sealy, W. B.....Rochester
Seefeld, P. H.....Rochester
Seybold, W. D.....Rochester
Shands, H. C.....Rochester
‡Sharpe, W. S.....Minneapolis
‡Shelden, J. T.....Rochester
Shelden, W. D.....Rochester
‡Shepard, V. D.....Rochester
Shick, R. M.....Rochester
Sidell, C. M.....Rochester
Simonton, K. M.....Rochester
Slocumb, C. H.....Rochester
Sluder, F. S., Jr.....Rochester
Smalley, R. E.....Rochester
Smith, F. B.....Rochester
Smith, F. D.....Rochester
‡Smith, F. H.....Rochester
Smith, F. L.....Rochester
Smith, H. L.....Rochester
Smith, L. A.....Rochester
Smith, N. D.....Rochester
‡Snell, A. M.....Rochester
Sprague, R. G.....Rochester

Standard, W. P.....Rochester
Stark, F. M.....Rochester
Stickney, J. M.....Rochester
Stilwell, G. G.....Rochester
Stotler, J. F.....Rochester
‡Stout, H. A.....Rochester
‡Stover, Lee .....Rochester
Stroebel, C. F., Jr.....Rochester
Strom, G. W.....Rochester
Stuhler, L. G.....Rochester
‡Svien, H. J.....Rochester

Taylor, J. C. .....Rochester
‡Thompson, G. J.....Rochester
Thornell, W. C.....Rochester
Throckmorton, T. D.....Rochester
Tierney, C. M.....Harmony
‡Tillisch, J. H.....Rochester
Tinney, W. S., Jr.....Rochester
Treusch, J. V.....Rochester
Trimingham, H. G. L.....Rochester
‡Tuohy, E. B.....Rochester
Turner, T. R.....Rochester
‡Tweedy, J. A.....Rochester
Twyman, R. A.....Rochester

Uihlein, Alfred.....Rochester
‡Underdahl, L. O.....Rochester

Vadheim, J. L.....Rochester
Van Demark, R. E.....Rochester
‡Vaughn, L. D.....Rochester
Vines, R. W.....Rochester

Wagener, H. P.....Rochester
Wakefield, E. G.....Rochester
Wallace, G. T.....Rochester
‡Walsh, M. N.....Rochester
‡Walters, Waltman.....Rochester
Ward, B. H.....Rochester
‡Watkins, C. H.....Rochester
Waugh, J. M.....Rochester
Weber, H. M.....Rochester
Weir, J. F.....Rochester
Wells, G. R.....Rochester
White, J. D.....Rochester
White, R. R., III.....Rochester
‡Whitehouse, F. R.....Rochester
Wilder, R. M.....Rochester
Wilder, R. M., Jr.....Rochester
Wilhelm, Agatha M.....Rochester
Williams, H. L.....Rochester
Williams, R. V.....Rushford
Willius, F. A.....Rochester
Willson, D. M.....Rochester
Wilson, K. G.....Rochester
Wilson, L. B.....Rochester
Wollaeger, E. E.....Rochester
Woltman, H. W.....Rochester
Wood, H. G.....Rochester
‡Wood, W. W., Jr.....Rochester
Woodruff, C. W.....Chatfield
Wulf, R. F.....Rochester
Wyrens, R. G.....Rochester

‡Yeager, C. L.....Rochester
Young, H. H.....Rochester

Zuschlag, Ella .....Rochester

PARK REGION DISTRICT AND COUNTY MEDICAL SOCIETY

Douglas, Grant, Otter Tail and Wilkin Counties
Annual meeting, December

Number of Members: 62

President

Patterson, W. L.....Fergus Falls

Secretary

Nelson, W. O. B.....Fergus Falls

Arndt, H. W.....Detroit Lakes
Baker, A. C.....Fergus Falls
Baker, N. H.....Fergus Falls
Bergquist, K. E.....Battle Lake
Blakey, A. R.....Osakis
Boline, C. A.....Battle Lake
Boyd, L. M.....Alexandria
‡Boysen, J. E.....Pelican Rapids
Boysen, Peter.....Pelican Rapids
Broker, W. S.....Wadena
Burnap, W. L.....Fergus Falls
Clifford, G. W.....Alexandria
Combacker, L. C.....Fergus Falls
Drought, W. W.....Fergus Falls
Esser, John.....Perham
Estrem, C. O.....Fergus Falls
Estrem, R. D.....Fergus Falls
‡Freeman, W. N.....Perham

Griswold, F. E.....Hoffman
Hanson, E. C.....New York Mills
Haskell, A. D.....Alexandria
Heiberg, E. A.....Fergus Falls
Jacobs, G. C.....Fergus Falls
Johnson, O. V.....Fergus Falls
Kierland, P. E.....Alexandria
*Lee, W. A.....Fergus Falls
Leibold, H. H. .....Parkers Prairie
‡Leighton, Robert .....Evansville
Lewis, A. J.....Henning
Lindley, S. B.....Fergus Falls
Love, F. A.....Carlos
Lund, C. J. T.....Fergus Falls
‡McElligott, E. W.....Breckenridge
McLane, W. O.....Perham
McMahon, L. H.....Breckenridge
Miller, W. A.....New York Mills
‡Mouritsen, G. J.....Fergus Falls
Naegeli, Frank.....Fergus Falls
Nelson, R. A.....Fergus Falls
Nelson, W. O. B.....Fergus Falls

Parson, L. R.....Elbow Lake
Parson, Lillian B.....Elbow Lake
Patterson, W. L.....Fergus Falls
Paulson, T. S.....Fergus Falls
‡Paulson, E. C.....Elbow Lake
Randall, A. M.....Ashby
Reeve, E. T.....Elbow Lake
Rimer, E. W.....Breckenridge
Satersmoen, Theodore..Pelican Rapids
Sather, E. R.....Alexandria
‡Schamber, W. F.....Parkers Prairie
‡Schleinitz, F. B.....Battle Lake
Serkland, J. C.....Rothsay
Siegel, Clarence.....Battle Lake
‡Stemsrud, H. L.....Alexandria
Sutton, H. R.....Hoffman
Tanquist, E. J.....Alexandria
Thompson, H. B.....Fergus Falls
‡Vail, J. B.....Henning
Warner, J. J.....Perham
‡Wasson, L. F.....Alexandria
‡Webster, L. J.....Battle Lake
Wray, W. E.....Campbell

RAMSEY COUNTY MEDICAL SOCIETY

Regular meetings, last Monday in every month excepting June, July, August
Annual meeting, last Monday in January

Number of Members: 376

President

McCarthy, W. R.....St. Paul

Secretary

Ryan, J. M.....St. Paul

Abbott, J. S.....St. Paul
‡Adair, A. F., Jr.....St. Paul
Ahrens, A. E.....St. Paul
Ahrens, A. H.....St. Paul
Alberts, M. W.....St. Paul
Alden, J. F.....St. Paul
Alexander, F. H.....St. Paul
†Armstrong, J. M.....St. Paul
Arnquist, A. S.....St. Paul
Aurelius, J. R.....St. Paul
Ausman, C. F.....St. Paul

Bacon, D. K.....St. Paul
†Bacon, L. C.....St. Paul
‡Balcome, M. M.....St. Paul
‡Barnes, R. G., Jr.....Hastings
Barry, L. W.....St. Paul
Barsness, Nellie O. N.....St. Paul
Beals, Hugh.....St. Paul
Beech, R. H.....St. Paul
‡Beek, H. O.....St. Paul
‡Beer, J. J.....St. Paul
Bell, C. C.....St. Paul

Benepe, J. L.....St. Paul
Bennion, P. H.....St. Paul
Bentley, N. P.....St. Paul
Bernstein, W. C.....St. Paul
Bicek, J. F.....St. Paul
Binger, H. E.....St. Paul
Birnberg, T. L.....St. Paul
Bock, R. A.....St. Paul
Boeckmann, Egil.....St. Paul
Bolender, H. L.....St. Paul
‡Borg, J. F.....St. Paul
Bouma, L. R.....St. Paul
Brand, G. D.....St. Paul
Bray, E. R.....St. Paul
Briggs, J. F.....St. Paul
Broadie, T. E.....St. Paul
Brodie, W. D.....St. Paul
†Brown, E. I.....St. Paul
Brown, J. C.....St. Paul
‡Bulinski, T. J.....St. Paul
‡Burch, E. P.....St. Paul
Burch, F. E.....St. Paul
Burns, R. M.....St. Paul
Burton, C. G.....St. Paul
Busher, H. H.....St. Paul

‡Cain, C. L.....St. Paul
Caldwell, J. P.....St. Paul

Carley, W. A. .....St. Paul
Carroll, W. C.....St. Paul
Chadbourn, C. R.....St. Paul
Chatterton, C. C.....St. Paul
Christiansen, A.....St. Paul
†Christison, J. T.....St. Paul
‡Clark, H. B., Jr.....St. Paul
Clarke, E. K.....St. Paul
‡Cochrane, B. B.....St. Paul
‡Coddon, W. D.....St. Paul
Colby, W. L.....St. Paul
Cole, W. H.....St. Paul
†Collie, H. G.....St. Paul
Colvin, A. R.....St. Paul
Connor, C. E.....St. Paul
‡Cook, C. K.....St. Paul
‡Cooper, C. C.....St. Paul
Countryman, R. S.....St. Paul
†Cowern, E. W.....No. St. Paul
Critchfield, L. R.....St. Paul
Crombie, F. J.....No. St. Paul
Crump, J. W.....St. Paul
Culligan, J. M.....St. Paul
Dack, L. G.....St. Paul
†Daugherty, E. B., Marine-on-St. Croix
Daugherty, L. E.....St. Paul
†Davis, Herbert.....St. Paul
†Davis, William.....St. Paul

DeCourcey, D. M.....St. Paul
Dedolph, Karl.....St. Paul
Delavan, P. A.....St. Paul
Derauf, B. I.....St. Paul
Dickson, T. H.....St. Paul
Dittman, G. C.....St. Paul
Donohue, P. F.....St. Paul
Dovre, C. M.....St. Paul
Drake, C. B.....St. Paul
Dunn, J. N.....St. Paul

Earl, George.....St. Paul
‡Earl, John .....St. Paul
Earl, Robert.....St. Paul
Edlund, G.....St. Paul
‡Edwards, J. W.....St. Paul
Edwards, T. J.....St. Paul
‡Eginton, C. T. .....St. Paul
Ely, O. S.....South St. Paul
Emerson, E. C.....St. Paul
Endress, E. K.....St. Paul
Enroth, O. E.....White Bear Lake
Ernest, G. C. H.....South St. Paul
†Eshelby, E. C.....St. Paul
Fahey, E. W.....St. Paul
Ferguson, J. C.....St. Paul
Fesler, H. H.....St. Paul
Flanagan, H. F.....St. Paul
Fogarty, C. W.....St. Paul
Fogelberg, E. J.....St. Paul
Foley, F. E. B.....St. Paul
Freeman, C. D.....St. Paul
Freidman, L. L.....St. Paul
Fritz, W. L.....St. Paul
Froats, C. W.....St. Paul

Gager, E. C.....St. Paul
Garbrecht, Arthur.....St. Paul
Gardiner, D. G.....St. Paul
Geer, E. K.....St. Paul
Gehlen, J. N.....St. Paul
Geist, G. A.....St. Paul
Ghent, C. H.....St. Paul
Gibbs, E. C.....St. Paul
†Gilfillan, J. S.....St. Paul
Gilkey, S. E.....St. Paul
Ginsberg, Wm.....St. Paul
Goltz, E. V.....St. Paul
Grant, H. W.....St. Paul
Gratzek, Thomas.....St. Paul
‡Grau, R. K.....St. Paul
Gruenhagen, A. P.....St. Paul

‡Haavik, J. E.....St. Paul
*Hagaman, G. K.....St. Paul
Hall, A. R.....St. Paul
Hall, H. H.....St. Paul
Hammes, E. M.....St. Paul
Hammond, J. F.....St. Paul
Hanson, H. B.....St. Paul
Harmon, G. E.....St. Paul
Hartfiel, W. F.....St. Paul
Hartley, E. C.....St. Paul
Hassett, M. F.....St. Paul
Hauser, V. P.....St. Paul
†Heath, A. C.....Stillwater
‡Heck, W. W.....St. Paul
Hedenstrom, F. G.....St. Paul
Hengstler, W. H.....St. Paul
Hensel, C. N.....St. Paul
Herman, Samuel.....St. Paul
Heron, R. C.....St. Paul
Herrmann, E. T.....St. Paul
Hertz, M. J.....St. Paul
Hilger, A. W.....St. Paul
Hilger, D. D.....St. Paul
‡Hilger, J. A.....St. Paul
Hilger, L. A.....St. Paul
Hilger, L. D.....St. Paul
Hiniker, L. P.....St. Paul
Hochfilzer, J. J.....St. Paul
Hoff, Alfred.....St. Paul
Hoffman, M. H.....St. Paul
†Holcomb, J. T.....Marine-on-St. Croix
Holcomb, O. W.....St. Paul
Holmen, R. W.....St. Paul
Holt, J. E.....St. Paul
‡Hopkins, G. W.....St. Paul
Howard, M. A.....St. Paul
Howard, W. S.....St. Paul
Hullsiek, H. E.....St. Paul
‡Hullsiek, R. B.....St. Paul

Ide, A. W.....St. Paul
Ikeda, Kano.....St. Paul
Ingerson, C. A.....St. Paul
Jesion, J. W.....St. Paul
Johanson, W. G.....St. Paul
Johnson, A. M.....St. Paul
Johnson, C. E.....St. Paul
Johnson, J. A.....St. Paul
†Johnson, T. H.....San Francisco, Calif.
Jones, E. M.....St. Paul

Kamman, G. R.....St. Paul
*Kannary, E. L.....St. Paul
‡Kaplan, D. H.....St. Paul
‡Karn, J. F.....St. Paul
‡Karon, I. M.....St. Paul
Kasper, E. M.....St. Paul
‡Katzovitz, Hyman.....St. Paul
Keefe, Rolland.....St. Paul
Kelly, J. V.....St. Paul
Kelly, P. H.....St. Paul
Kenefick, E. V.....St. Paul
Kennedy, W. A.....St. Paul
Kenyon, T. J.....St. Paul
Kesting, Herman.....St. Paul
King, G. L.....St. Paul
Klein, H. N.....St. Paul
Knauff, M. K.....St. Paul
Koch, F. L. P.....St. Paul
‡Koepsell, A. A. H.....St. Paul
Kugler, A. A.....St. Paul
Kvitrud, Gilbert.....St. Paul

Langenderfer, F. V.....St. Paul
Larsen, C. L.....St. Paul
Larson, Eva-Jane .....St. Paul
‡Lauer, I9. J.....St. Paul
Lax, M. H.....St. Paul
Leahy, Bartholomew.....St. Paul
Leavenworth, R. O.....St. Paul
‡Leick, R. M.....St. Paul
Leitch, Archibald.....St. Paul
Lepak, J. A.....St. Paul
†Lerche, William .....Cable, Wis.
Leven, N. L.....St. Paul
Levin, Bert.....St. Paul
Levitt, G. X.....St. Paul
Lick, C. L.....St. Paul
Lightbourn, E. L.....St. Paul
Lilleberg, N. J.....St. Paul
Lippman, H. S.....St. Paul
†Little, W. J.....St. Paul
Loken, S. M.....St. Paul
Lowe, E. R.....South St. Paul
Lowe, T. A.....South St. Paul
Lundholm, A. M.....St. Paul
Lynch, F. W.....St. Paul

Madden, J. F.....St. Paul
‡Marks, R. W.....St. Paul
Martin, D. L.....So. St. Paul
Martineau, J. L.....St. Paul
Mattson, C. H.....St. Paul
McCain, D. L.....St. Paul
McCarthy, J. J.....St. Paul
McCarthy, W. R.....St. Paul
McClanahan, J. H.....White Bear
McClanahan, T. S.....White Bear
McEwan, Alexander.....St. Paul
†McLaren, Jennette M.....Minneapolis
Meade, J. R.....St. Paul
Mears, B. J.....St. Paul
‡Medelman, J. P.....St. Paul
Meyerding, E. A.....St. Paul
Moga, J. A.....St. Paul
Molander, H. A.....St. Paul
Moquin, Marie A.....St. Paul
‡Moren, L. A.....St. Paul
Moriarty, Berenice.....St. Paul
†Morrissey, F. B.....St. Paul
Muller, R. T.....St. Paul

‡Naegeli, A. E.....St. Paul
Nelson, L. A.....St. Paul
‡Newell, F. W.....St. Paul
Nichols, A. E.....St. Paul
Noble, J. F.....St. Paul
‡Noble, J. L.....St. Paul
‡Nuebel, C. J.....St. Paul
Nye, Katherine A.....St. Paul
Nye, Lillian L.....St. Paul

‡O'Brien, W. M.....St. Paul
‡O'Connor, L. J.....St. Paul
Oerting, Harry.....St. Paul
‡Ogden, Warner.....St. Paul
Ohage, Justus, Jr.....St. Paul
Olson, C. A.....St. Paul
Olson, R. L.....St. Paul
O'Reilley, B. E.....St. Paul
Ostergren, E. W.....St. Paul
Ouelette, A. J.....St. Paul

Pearson, F. R.....St. Paul
Pearson, M. M.....St. Paul
Pederson, A. H.....St. Paul
Perry, C. G.....St. Paul
Peterson, D. B.....St. Paul
Peterson, H. O.....St. Paul
Peterson, J. L. E.....St. Paul
Peterson, V. N.....St. Paul
Plondke, F. J.....St. Paul
Prendergast, H. J.....St. Paul

Radabaugh, R. C.....Hastings
‡Ramsey, R. M.....St. Paul
†Ramsey, W. R.....St. Paul
Rasmussen, R. C.....St. Paul
Rea, C. E.....St. Paul
‡Reif, H. J.....St. Paul
Richards, E. T. F.....St. Paul
Richardson, H. E.....St. Paul
Rick, P. F. W.....St. Paul
*Ritchie, H. P.....St. Paul
‡Ritchie, W. P.....St. Paul
Ritt, A. E.....St. Paul
Rogers, S. F.....St. Paul
Rosenbladt, Louis.....St. Paul
‡Rosenholtz, Burton.....St. Paul
Rosenthal, Robert.....St. Paul
†Rothrock, J. L.....St. Paul
Rothschild, H. J.....St. Paul
Roy, P. C.....St. Paul
Ruhberg, G. N.....St. Paul
Rutherford, W. C.....St. Paul
Ryan, J. J.....St. Paul
Ryan, J. M.....St. Paul
Ryan, M. E.....St. Paul

Sarnecki, M. M.....St. Paul
Satterlund, V. L.....St. Paul
Savage, F. J.....St. Paul
Schoch, R. B. J.....St. Paul
Schons, Edward.....St. Paul
‡Schroeckenstein, H. F.....St. Paul
Schuldt, F. C.....St. Paul
Schulze, A. G.....St. Paul
Schwyzer, Arnold.....St. Paul
‡Schwyzer, H. C.....St. Paul
Scott, E. E.....St. Paul
†Senkler, G. E.....St. Paul
Setzer, H. J.....St. Paul
Shannon, W. R.....St. Paul
Shellman, J. L.....St. Paul
Shillington, M. A.....Glendive, Mont.
‡Shimonek, S. W.....St. Paul
Short, Jacob.....St. Paul
‡Simons, L. T.....St. Paul
Singer, B. J.....St. Paul
Skinner, H. O.....St. Paul
Smisek, E. A.....St. Paul
Smith, V. D. E.....St. Paul
Snyder, G. W.....St. Paul
Sohlberg, O. I.....St. Paul
Sommers, Ben.....St. Paul
‡Sorem, M. B.....St. Paul
Souster, B. B.....St. Paul
Sprafka, J. M.....St. Paul
Steinberg, C. L.....St. Paul
Sterner, E. G.....St. Paul
Sterner, E. R.....St. Paul
Sterner, O. W.....St. Paul
Stewart, Alexander.....St. Paul
Stinnette, S. E.....St. Paul
Stolpestad, A. H.....St. Paul
Stolpestad, H. L.....St. Paul
Strate, G. E.....St. Paul
‡Strauss, M. L.....St. Paul
Swanson, J. A.....St. Paul
Swendson, J. J.....St. Paul

Teisberg, C. B.....St. Paul
‡Thompson, F. A.....St. Paul
Thoreson, M. O.....South St. Paul
Tifft, C. R.....St. Paul
Tracht, R. R.....St. Paul
Travis, J. S. .....St. Paul
Tregilgas, H. R.....South St. Paul

Veirs, Dean.....St. Paul
Veirs, Ruby S.....St. Paul
Venables, A. E.....St. Paul
Von der Weyer, William.....St. Paul

Waas, C. W.....St. Paul
Walker, A. E.....St. Paul
‡Walsh, F. M.....St. Paul
‡Walter, C. W.....St. Paul
Warnock, R. W.....St. Paul
‡Warren, C. A.....St. Paul
Watz, C. E.....St. Paul
Webber, F. L.....St. Paul
‡Weis, B. A.....St. Paul
Weisberg, Maurice .....St. Paul
*Welch, M. C.....St. Paul
Wenzel, G. P.....St. Paul
Werner, O. S.....Cambridge
Wheeler, M. W.....St. Paul
‡Whitacre, J. C.....St. Paul
Whitmore, F. W.....St. Paul
Williams, A. B.....St. Paul
Williams, C. K.....St. Paul
Williams, J. A.....St. Paul
‡Williamson, G. A.....St. Paul
‡Wilson, J. A.....St. Paul
Wilson, J. V.....St. Paul
Winnick, J. B.....St. Paul
Wold, K. C.....St. Paul
‡Wolfe, H. H.....St. Paul
Wolff, H. J.....St. Paul
‡Wolkoff, H. J.....St. Paul

Youngren, E. R.....St. Paul

Zachman, L. L.....St. Paul
Zimmermann, H. B.....St. Paul

RED RIVER VALLEY MEDICAL SOCIETY

Kittson, Mahnomen, Marshall, Norman, Pennington, Polk, Red Lake and Roseau Counties
Regular meetings, Second Tuesday, April, October and December
Annual meeting, December
Number of Members: 59

President
Loken, Theodore.....Ada

Secretary
Oppegaard, C. L.....Crookston

Adkins, C. M.....Thief River Falls
‡Anderson, W. E...Thief River Falls
Anderson, W. S.....Minneapolis
Behr, O. K.....Crookston
Berge, D. O.....Roseau
Berlin, A. S.....Hallock
Bertelson, O. L.....Crookston
Biedermann, Jacob..Thief River Falls
‡Boardman, D. V.....Twin Valley
Bohl, G. W.....Ada
Bratrud, Edward....Thief River Falls
Brink, A. A.....Baudette
Brown, L. L.....Crookston
Cameron, J. H.....Erskine
‡Delmore, J. L., Jr.....Roseau
Delmore, J. L., Sr.....Roseau
‡Derifield, R. S.....Crookston
Ederer, J. J.....Mahnomen
Erickson, Eskil.....Halstad
Griffin, P. J.....Fertile
‡Hackie, E. A.....Hallock
Hedemark, H. H.....Thief River Falls
Helseth, H. K.....Thief River Falls
Henney, W. H.....McIntosh
Heyerman, O. T.....Warren
Hollands, W. H.....Fisher
Holmstrom, C. H.....Warren
Jacobson, C. W.....Thief River Falls
Kirk, G. P.....East Grand Forks
‡Knutson, G. A.....Greenbush
Kostick, W. R.....Fertile
Leitch, N. M.....Warroad
Loken, Theodore.....Ada
Lynde, O. G.....Thief River Falls
Mellby, O. F.....Thief River Falls
Mercil, W. F.....Crookston
Morley, G. A.....Crookston
Norman, J. F.....Crookston
*Ohnstad, J. L.....McIntosh
Oppegaard, C. L.....Crookston
Oppegaard, M. O.....Crookston
Paradis, W. G.....Crookston
Parsons, J. G.....Crookston
Pearson, L. O.....Warroad
Petkevich, F. M.....Red Lake Falls
Reff, A. R.....Crookston
‡Rice, H. R.....Roseau
Sather, Allen.....Fosston
‡Sather, G. A.....Fosston
‡Sather, R. N.....McIntosh
‡Sather, R. O.....Crookston
Shaleen, A. W.....Hallock
Shedlov, Abraham.....Fosston
Starekow, M. D.....Thief River Falls
Stevens, John.....Gonvick
Stocking, F. F.....Hallock
‡Teisberg, J. E.....Middle River
Torgerson, W. B.....Oklee
Uhley, C. G.....Crookston
Wiltrout, I. G.....Oslo

REDWOOD-BROWN COUNTY MEDICAL SOCIETY

Regular meetings, Quarterly
Annual meeting, May
Number of Members: 32

President
Wohlrabe, E. J.....Springfield

Secretary
Fesenmaier, O. B.....New Ulm

‡Abbott, C. B.....Springfield
‡Anderson, E. M.....Lamberton

‡Benton, P. C.....Gibbon
Cairns, R. J.....Redwood Falls
Dubbe, F. H.....New Ulm
‡Dysterheft, A. F.....Gaylord
Eaves, G. B.....Wabasso
Esser, O. J.....New Ulm
Ferguson, W. C.....Walnut Grove
Fesenmaier, O. B.....New Ulm
Fritsche, Albert.....New Ulm
Fritsche, C. J.....New Ulm
Fritsche, T. R.....New Ulm
Gibbons, F. C.....Comfrey
Goblirsch, A. P.....Sleepy Eye
Hammermeister, T. F.....New Ulm
Hovde, Rolf.....Winthrop
Just, H. J.....Hastings
Kusske, A. L.....New Ulm
Nuessle, W. G.....Springfield
Penk, E. R.....Springfield
Peterson, R. A.....Vesta
†Reineke, G. F.....New Ulm
Saffert, C. A.....New Ulm
Schroeppel, J. E.....Winthrop
Seifert, O. J.....New Ulm
‡Shima, G. J.....Sleepy Eye
Vogel, H. A. L.....New Ulm
Vogel, J. H.....New Ulm
Wahlberg, E. W.....Sleepy Eye
Weiser, G. B.....New Ulm
Wohlrabe, E. J.....Springfield

RENVILLE COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday of each month
Annual meeting, November
Number of Members: 22

President
Cosgriff, J. A.....Olivia

Secretary
Billings, R. E.....Franklin

Adams, R. C.....Bird Island
Billings, R. E.....Franklin
Brand, W. A.....Redwood Falls
Bushard, W. J.....Bird Island
‡Ceplecha, S. F.....Redwood Falls
Cole, J. G.....Redwood Falls
Cosgriff, J. A.....Olivia
Dordal, J.....Sacred Heart
Erickson, R. E.....Hector
Fawcett, A. M.....Renville
Flinn, T. E.....Redwood Falls
Gaines, E. C.....Buffalo Lake
‡Hartmann, C. M.....Fairfax
Johnson, O. H.....Redwood Falls
Johnson, W. E.....Morgan
Lenz, J. R.....Morton
‡Madland, R. S.....Fairfax
Mesker, G. H.....Olivia
Passer, A. A.....Olivia
Penhall, F. W.....Morton
Preisinger, J. W.....Renville
‡Rinkey, Eugene.....Redwood Falls

RICE COUNTY MEDICAL SOCIETY

Regular meetings, at call
Annual meeting, at call
Number of Members: 28

President
‡Hanson, A. M.....Faribault

Secretary
Weaver, P. H.....Faribault

Beede, Ethel R.....Faribault
Dungay, N. S.....Northfield
Engberg, E. J.....Faribault
Francis, D. W.....Morristown
‡Hanson, A. M.....Faribault
Huxley, F. R.....Faribault
‡Kanne, C. W.....Faribault
Lexa, F. J.....Lonsdale
Lufkin, C. D.....Northfield
Lyght, C. E.....New York, N. Y.
McKeon, J. O.....Montgomery
Mears, R. F.....Northfield
Meyer, F. C.....Kenyon
Meyer, P. F.....Faribault
Moses, Joseph, Jr.....Northfield
Moses, R. R.....Kenyon
‡Nielsen, A. M.....Northfield
Nuetzman, A. W.....Faribault
Ould, C. L.....Minneapolis
Robilliard, C. M.....Faribault
Rohrer, C. A.....Waterville
‡Rumpf, C. W.....Faribault
†Rumpf, W. H.....Faribault
Stevenson, F. W.....Faribault
Traeger, C. A.....Faribault
Warren, F. S.....Washington, D. C.
Weaver, P. H.....Faribault
Wilson, Warren.....Northfield

ST. LOUIS COUNTY MEDICAL SOCIETY

Carlton, Cook, Itasca, Lake and St. Louis Counties
Regular meetings, second Thursday every month except July and August
Annual meeting, December
Number of Members: 243

President
Kohlbry, C. O.....Duluth

Secretary
Buckley, R. P.....Duluth
Abraham, A. L.....Duluth

Adams, B. S.....Hibbing
‡Addy, E. R.....Gilbert
‡Ahl, C. W.....Hibbing
Akins, W. M.....Eveleth
Albrecht, H. H.....Floodwood
Anderson, H. R.....Deer River
‡Anderson, C. L.....Duluth
‡Arko, J. L.....Hibbing
Armstrong, E. L.....Duluth
Athens, A. G.....Duluth
Ayres, G. T.....Ely
Bachnik, F. W.....Hibbing
‡Bagley, C. M.....Duluth
Bagley, Elizabeth C.....Duluth
Bagley, W. R.....Duluth
Bakkila, Henry.....Duluth
Bardon, Richard.....Duluth
Barney, L. A.....Duluth
Barrett, E. E.....Duluth
‡Batty, J. L.....Duluth
‡Becker, F. T.....Duluth
Bender, J. H.....Big Fork
Bepko, Marie K.....Cloquet
Berdez, G. L.....Duluth
Bianco, A. J.....Duluth
Binet, H. E.....Grand Rapids
Blakely, C. C.....Barnum
Boman, P. G.....Duluth
Bowen, R. L.....Hibbing
‡Boyer, S. H., Jr.....Duluth
Boyer, S. H., Sr.....Duluth
Braun, O. C.....Nashwauk
Braverman, N. J.....Duluth
Bray, P. N.....Duluth
Bray, R. B.....Biwabik
Buckley, R. P.....Duluth

Butler, J. K.....Carlton
Cantwell, W. F.....International Falls
Carstens, C. F.....Hibbing
Chapman, T. L.....Duluth
*Cheney, E. L.....Duluth
Chermak, F. G.....International Falls
Chesley, Ward B.....Virginia
‡Christensen, C. H.....Duluth
Christensen, E. P.....Two Harbors
‡Clapp, Stewart .....Duluth
Clark, F. F.....Duluth
‡Cleaves, W. D.....Grand Rapids
‡Clement, T. G.....Duluth
Collins, A. N.....Duluth
†Collins, H. C.....Duluth
Coventry, W. A.....Duluth
‡Coventry, W. D.....Duluth
‡Cunningham, C. B.....Virginia

Davies, R. J.....Nopeming
Dickson, F. H., Jr.....Proctor
Doolittle, L. E.....Duluth
‡Doyle, G. C.....Duluth

Eckman, P. F.....Duluth
Eckman, R. J.....Duluth
Ekblad, J. W.....Duluth
Elias, F. J.....Duluth
‡Elliott, W. S.....Virginia
Emanuel, K. W.....Duluth
Eppard, R. M.....Cloquet
Erskine, G. M.....Grand Rapids
Estrem, T. A.....Hibbing
Ewens, H. B.....Virginia

Fankboner, A. V.....Buhl
Fawcett, K. R.....Duluth
‡Fellows, M. F.....Duluth
‡Feuling, J. C.....Bovey
Fischer, M. McC.....Duluth
‡Fisketti, Henry .....Duluth
Forbes, R. S.....Duluth

Gendron, J. F.....Grand Rapids
Gillespie, M. G.....Duluth
Goldish, D. R.....Duluth
Goodman, C. E.....Virginia
‡Gowan, L. R.....Duluth
‡Grabow, J. J.....Duluth
Grahek, J. P.....Ely
‡Graves, W. N.....Duluth

Haney, C. L.....Duluth
Hanson, E. O.....Cloquet
‡Harlowe, H. D.....Virginia
‡Harri, E. J.....Carlton
Harris, C. N.....Hibbing
Hatch, W. E.....Duluth
‡Hathaway, S. J.....Proctor
Hayes, M. F.....Nashwauk
Hedberg, G. A.....Nopeming
Heiam, W. C.....Cook
Hilding, A. C.....Duluth
Hill, F. E.....Duluth
Hirschboeck, F. J.....Duluth
†Hirschfield, M. S.....Duluth
Hoff, H. O.....Duluth
‡Honke, R. W.....Proctor
Houkom, S. S.....Duluth
Hursh, M. M.....Hibbing
Hutchinson, Henry.....Moose Lake

Jacobson, Clarence.....Chisholm
Jensen, T. J.....Duluth
Jessico, C. M.....Duluth
‡Johnson, K. E. .....Duluth
Johnsrud, L. W.....Chisholm
Jolin, F. M.....Bovey
Jolin, R. V.....Grand Rapids

‡Kelly, A. C.....Duluth
Kemp, M. W.....Moose Lake
Kiesling, I. H.....Coleraine
Kingsbury, E. M.....Moose Lake
Klein, Harry.....Duluth
Knapp, F. N.....Duluth
Kohlbry, C. O.....Duluth
Kotchevar, F. R.....Eveleth
‡Kozberg, Oscar.....Moose Lake
Kraft, Peter.....Duluth

‡La Bree, R. H.....Duluth
Laird, A. T.....Nopeming
Lenont, C. B.....Virginia
Lepak, F. J.....Duluth
Litman, S. N.....Duluth
Loofbourrow, E. H.....Keewatin
Lynam, Frank.....Duluth

Macfarlane, P. H.....Chisholm
‡MacRae, G. C.....Duluth
Magney, F. H.....Duluth
Malmstrom, J. A.....Virginia
Manley, J. R.....Duluth
†Marcley, W. J.....Minneapolis
Martin, W. C.....Duluth
‡Mayne, R. M.....Duluth
McCarty, P. D.....Ely
*McComb, C. F.....Duluth
†McCoy, Mary K.....Duluth
McDonald, A. L.....Duluth
McHaffie, O. L.....Duluth
McKenna, M. J.....Grand Rapids
McLeod, J. L.....Grand Rapids
McNutt, J. R.....Duluth
Mead, C. H.....Duluth
Merriman, L. L.....Duluth
‡Meyer, J. O.....Grand Rapids
‡Minkler, J. E.....Virginia
Minty, Earl W.....Duluth
Moe, R. J.....Duluth
Moe, Thomas.....Moose Lake
‡Mollers, T. P.....Mountain Iron
Monroe, P. B.....Cloquet
‡Monserud, N. O.....Cloquet
More, C. W.....Eveleth
Morsman, L. W.....Hibbing
Mueller, R. F.....Two Harbors
Mueller, Selma C.....Duluth

Neff, W. S.....Virginia
Nelson, E. H.....Chisholm
‡Nelson, L. S.....Hibbing
‡Nelson, R. L.....Duluth
Nicholson, M. A.....Duluth
Nissen, A. S.....Duluth
Norberg, C. E.....Cloquet
Nutting, R. E.....Duluth

Olson, A. E.....Duluth
Olson, A. O.....Duluth

Palmer, H. A.....Black Duck
†Parker, O. W.....Ely
Parker, W. H.....Chisholm
Parson, E. I.....Duluth
Pasek, A. W.....Cloquet
‡Patch, O. B.....Duluth
‡Patterson, S. A.....Duluth
Pearsall, R. P.....Virginia
Pedersen, R. C.....Duluth
Pennie, D. F.....Duluth
Peterson, E. N.....Virginia
‡Peterson, J. H.....Duluth
Pfuetze, K. H.....Cannon Falls
Plowman, E. T.....Marble
Power, J. E.....Duluth
Puumala, R. H.....Cloquet

Raadquist, C. S.....Hibbing
Raihala, John.....Virginia
Raiter, R. F.....Cloquet
†Robinson, J. M.....Corning, N. Y.
Rokala, H. E.....Virginia
Rood, D. C.....Duluth
‡Rosenfield, A. B.....Hibbing
Rowe, O. W.....Duluth
Rowles, E. K.....Coleraine
‡Rudie, P. S.....Duluth
Ryan, W. J.....Duluth

‡Sach-Rowitz, Alvan.....Moose Lake
Salter, R. A.....Virginia
Sarff, O. E.....Virginia
Sax, S. G.....Duluth
Scherer, C. A.....Duluth
Schroder, C. H.....Duluth
‡Schweiger, T. R.....Hibbing
‡Seashore, R. T.....Duluth
Shapiro, E. Z.....Duluth
Shastid, T. H.....Duluth
Shaw, A. W.....Virginia
Siegel, J. S.....Virginia
Sinamark, Andrew.....Hibbing
Sisler, C. E.....Grand Rapids
Smith, C. M.....Duluth
Smith, W. R.....Grand Marais
‡Snyker, O. E.....Ely
Spang, A. J.....Duluth
Spang, J. S.....Duluth
Spicer, F. W.....Duluth
Spurbeck, R. G.....Cloquet
Strathern, M. L.....Gilbert
‡Stewart, D. E.....Grand Rapids
Strobel, W. G.....Duluth
Stuart, A. B.....Cloquet
Sutherland, H. N.....Ely
Sutton, Janet B.....Grand Rapids
‡Swanson, P. E.....Virginia
‡Swedberg, W. A.....Duluth
‡Swenson, A. O.....Duluth

Taylor, C. W.....Duluth
‡Tibbetts, M. H.....Duluth
Tilderquist, D. L.....Duluth
Tingdale, Carlyle.....Hibbing
‡Trytten, E. G.....Middle River
‡Tudor, R. B.....Hibbing
Tuohy, E. L.....Duluth

‡Urberg, S. E.....Duluth

‡Van Valkenberg, J. D.....Floodwood
Vercellini, C. E.....Duluth

†Walker, A. E.....Duluth
Wallace, M. O.....Duluth
Watson, C. G.....Soudan
Webber, E. E.....Duluth
Wells, A. H.....Duluth
‡Wheeler, D. W.....Duluth
‡Williams, J. A.....Hibbing
Winter, J. A.....Duluth
Young, T. O.....Duluth
Zemen, E. W.....Hibbing
Zlatovski, M. L.....Duluth

SCOTT-CARVER COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday of the month
Annual meeting, June
Number of Members: 35

President
Schimelpfenig, G. T.....Chaska

Secretary
Pearson, B. F.....Shakopee

‡Bodaski, A. A.....Montgomery
Buck, F. H.....Shakopee
Cervenka, C. F.....New Prague
‡Dworak, A. F.....St. Paul
*Eklund, E. J.....Norwood
Emmerson, W. S.....Mayer
Havel, H. W.....Jordan
Hebeisen, M. B.....Chaska
Juergens, H. M.....Belle Plaine
‡Klein, J. C.....Shakopee
Kortsch, F. P.....Prior Lake
‡Krieser, A. E.....Boyd
‡Kucera, L. J.....Lonsdale
Kucera, S. T.....Lonsdale
Maertz, W. F.....New Prague
Malerich, J. A.....Shakopee
Martin, T. P.....Arlington
Nagel, H. D.....Waconia
‡Nelson, K. L.....Montgomery
Ninneman, N. N.....Waconia
Novak, E. E.....New Prague
‡Olson, C. J.....Belle Plaine
*Ormond, D. T.....Waconia
Pearson, B. F.....Shakopee
Phillips, W. H.....Jordan
Pogue, R. E.....Watertown
‡Ponterio, J. E.....Shakopee
‡Reiter, H. W.....Shakopee
Schimelpfenig, G. T.....Chaska
†Shrader, J. S.....Springfield
Simons, B. H.....Chaska
†Westerman, A. E.....Montgomery
Westerman, F. C.....Montgomery
‡Wiechman, F. H.....Montgomery
Wunder, H. E.....Shakopee

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

Cottonwood, Jackson, Murray, Nobles, Pipestone and Rock Counties
Annual meeting, November
Number of Members: 65

President
Basinger, H. P.....Windom

Secretary
Mork, B. O., Jr.....Worthington

Anderson, O. W.....Luverne
Arnold, E. W.....Adrian
‡Balmer, A. I.....Pipestone
Basinger, H. P.....Windom
Basinger, H. R.....Mountain Lake
Beckering, Gerrit.....Edgerton
Benjamin, W. G.....Pipestone
Bofenkamp, F. W.....Luverne
Brown, A. H.....Pipestone
Carlson, J. V.....Westbrook

Chadbourn, A. G.....Heron Lake
Chunn, S. S.....Pipestone
Cress, P. J.....Ellsworth
DeBoer, Hermanus.....Edgerton
Doman, V. W.....Lakefield
Doms, H. C. A.....Slayton
Engh, Sigfred.....Jackson
Halloran, W. H.....Jackson
Halpern, D. J.....Brewster
Harrison, P. W.....Worthington
Hebbel, Robert.....Minneapolis
Heiberg, O. M.....Worthington
Hitchings, W. S.....Lakefield
Hoyer, L. J.....Windom
Johnson, R. E.....Worthington
Johnston, L. F.....Slayton
Kilbride, E. A.....Worthington
Kilbride, J. S.....Canby
Larson, J. T.....Lake Wilson
Lohmann, J. G.....Jasper
Maitland, D. P.....Jackson
Maitland, E. T.....Jackson
†Manson, F. M.....Worthington
McElmeel, E. F.....Pipestone
McLane, Evelyn G.....Jackson
Mork, B. O., Jr.....Worthington
Mork, B. O., Sr.....Worthington
Nealy, D. E.....Adrian
‡Pankratz, P. J.....Mountain Lake
Pierson, R. F.....Slayton
Piper, W. A.....Mountain Lake
Rogers, C. W.....Heron Lake
Rose, J. T.....Lakefield
Schade, F. L.....Worthington
Schutz, E. S.....Mountain Lake
‡Schmidt, W. R.....Worthington
Sether, A. F.....Ruthton
Sherman, C. L.....Luverne
‡Sjostrom, L. E.....Storden
Slater, S. A.....Worthington
‡Smith, G. G.....Fulda
Sogge, L. L.....Windom
Sorum, F. T.....Jasper
Stanley, C. R.....Worthington
Stevenson, B. M.....Fulda
Stratte, H. C.....Windom
‡Taylor, E. S.....Worthington
*Thorson, E. O.....Luverne
Tofte, Josephine.....Minneapolis
Waller, J. D.....Wilmont
‡Wells, W. B.....Jackson
Williams, C. A.....Pipestone
Williams, L. A.....Slayton
‡Wilson, I. H.....Worthington
†Wright, C. O.....Luverne

STEARNS-BENTON COUNTY MEDICAL SOCIETY

Regular meetings, third Thursday of the month
Annual meeting, third Thursday of December
Number of Members: 54

President
McDowell, J. P.....St. Cloud
Secretary
Libert, J. N.....St. Cloud

Barnett, J. M.....Cold Spring
Baumgartner, F. H.....Albany
Beuning, J. B.....St. Cloud
Brigham, C. F.....St. Cloud
Buscher, J. C.....St. Cloud
Clark, H. B.....St. Cloud
Donaldson, C. S.....Foley
DuBois, J. F.....Sauk Center
Engstrom, G. F.....Belgrade
Evans, L. M.....Sauk Rapids
Fleming, T. N.....St. Cloud
Freeman, W. L.....St. Cloud
Friesleben, William.....Sauk Rapids
Gaida, J. B.....St. Cloud
‡Goehrs, G. H.....St. Cloud
Goehrs, H. W.....St. Cloud
Haberman, Emil.....Osakis
Halenback, P. L.....St. Cloud
†Hemstead, Werner.....Fergus Falls
Henry, C. J.....Milaca
Jones, R. N.....St. Cloud
Keithahn, E. E.....Kimball
‡Kern, M. C.....Freeport
‡Kettlewell, R. B.....Sauk Center
Kohler, D. W.....St. Joseph
Koop, S. H.....Richmond
Kuhlmann, August.....Melrose
Lewis, C. B.....St. Cloud
Libert, J. N.....St. Cloud
Mahowald, A.....Albany
McDowell, J. P.....St. Cloud
Meyer, A. A.....Melrose
‡Moos, D. J.....Minneapolis
Musachio, N. F.....Foley
Myre, C. R.....Paynesville
Nessa, C. B.....St. Cloud
Raetz, S. J.....Maple Lake
Rathbun, C. A.....St. Cloud
Richards, W. B.....St. Cloud
Rumpf, W. H.....Dallas, Texas
Sandven, N. O.....Paynesville
Schatz, F. J.....St. Cloud
Schmitz, E. J.....Holdingford
Sherwood, G. E.....Kimball
Stangl, P. E.....St. Cloud
‡Stewart, N. E.
Fort Leonard Wood, Mo.
‡Street, Bernard.....St. Cloud
†Sutton, C. S.....St. Cloud
Townsend, De Wayne.....Brooten
Veranth, L. A.....St. Cloud
Walfred, K. A.....St. Cloud
‡Watson, W. J.....Holdingford
Wenner, W. T.....St. Cloud
Zachman, A. H.....Melrose

STEELE COUNTY MEDICAL SOCIETY

Regular meetings, at call
Annual meeting, February
Number of Members: 16

President
McIntyre, J. A.....Owatonna
Secretary
Dewey, D. H.....Owatonna

‡Berghs, L. V.....Owatonna
Dewey, D. H.....Owatonna
Ertel, E. Q.....Ellendale
Hartung, E. H.....Claremont
Kurtin, H. J.....Blooming Prairie
‡McEnaney, C. T.....Owatonna
McIntyre, J. A.....Owatonna
Melby, Benedik.....Blooming Prairie
Morehead, D. E.....Owatonna
Nelson, E. J.....Owatonna
Roberts, O. W.....Owatonna
Schaefer, J. F.....Owatonna
Senn, E. W.....Owatonna
Stewart, A. B.....Owatonna
‡Stransky, T. W.....Owatonna
Wilkowske, R. J.....Owatonna

UPPER MISSISSIPPI MEDICAL SOCIETY

Aitkin, Beltrami, Cass, Clearwater, Crow Wing, Hubbard
Koochiching, Lake of the Woods, Morrison, Todd and Wadena Counties
Regular meetings, Spring, Summer, Fall, Winter
Annual meeting, January
Number of Members: 99

President
Lee, H. W.....Brainerd
Secretary
Badeaux, G. I.....Brainerd

Adkins, G. H.....Pine River
Amundson, A. E.....Little Falls
Badeaux, G. I.....Brainerd
Beise, R. A.....Brainerd
Borgerson, A. H.....Long Prairie
Bosland, H. G.....Verndale
‡Bray, K. E.....Park Rapids
Cardle, G. E.....Brainerd
Carlson, C. E.....Aitkin
†Christie, G. R.....Long Prairie
Cook, J. M.....Staples
‡Coombs, C. H.....Cass Lake
†Corrigan, J. E.....Spooner
Craig, C. C.....International Falls
Crow, E. R.....Ah-Gwah-Ching
‡Davis, L. F.....Wadena
Davis, L. T.....Wadena
Davis, R. D.....Clearbrook
Davis, T. C.....Wadena
‡East, John.....Northome
Eiler, John.....Park Rapids
Eyres, T. E.....Pequot
‡Fait, R. V.....Little Falls
Fitzsimons, W. E.....Brainerd
Frost, H. T.....Wadena
Garlock, A. V.....Bemidji
Garlock, D. H.....Bemidji
Gerber, M. P.....Brainerd
Ghostley, Mary C.....Puposky
‡Gifford, B. L.....Long Prairie
†Gilmore, Rowland.....Bemidji
Gorenflo, Leila.....Ah-Gwah-Ching
Grogan, J. S.....Wadena
Groschupf, T. P.....Bemidji
Grose, F. N.....Clarissa
Halladay, G. J.....Brainerd
‡Haller, William.....Bemidji
Hanover, R. D.....Littlefork
Hawkinson, J. P.....Crosby
Healy, R. T.....Pierz
Higgs, W. W.....Park Rapids
House, Z. E.....Cass Lake
‡Houston, D. M.....Park Rapids
Hubbard, O. E.....Brainerd
Hubin, E. G.....Deerwood
‡Idstrom, L. G.....Minneapolis
Jamieson, E. F.....Brainerd
†Johnson, C. E.....Pine River
Johnson, D. L.....Little Falls
Johnson, E. W.....Bemidji
Kerlan, Irvin.....Washington, D. C.
Knight, E. G.....Swanville
‡Koskela, L. E.....Sebeka
Lamb, H. L.....Little Falls
Larson, L. J.....Bagley
Lee, H. W.....Brainerd
Leemhuis, G. H.....Aitkin
Lenarz, A. J.....Browerville
Lund, W. J.....Staples
‡Mark, Hilbert.....Minneapolis
‡Mason, J. A.....International Falls
McCann, D. F.....Bemidji
Mitby, I. L.....Aitkin
Monahan, R. H...International Falls
Mosby, M. E.....Long Prairie
‡Mulligan, A. M.....Brainerd
‡Murray, R. A.....Aitkin
Nelson, N. P.....Brainerd
‡O'Leary, J. H.....Staples
Petraborg, H. T.....Aitkin
Pierce, C. H.....Wadena
‡Potek, David.....International Falls
Quanstrom, V. E.....Brainerd
†Ratcliffe, J. J.....Aitkin
Reichelderfer, C. F.....Staples
Ringle, O. F.....Walker
‡Schulze, W. M.....Swanville
Shannon, S. S.....Ironton
Silver, Henry.....Sebeka
Simons, E. J.....Swanville
‡Simons, S. J.....Akeley
Smith, B. A.....Crosby
‡Stafford, C. E.....Baudette
Stein, R. J.....Pierz
‡Swedenburg, P. A.....Swanville
Thabes, J. A., Jr.....Brainerd
Thabes, J. A., Sr.....Brainerd
Trommald, Gladys, B. K.
Northville, Mich.
‡Vandersluis, C. W.....Bemidji
Watson, A. M.....Royalton
†Watson, J. D.....Minneapolis
Watson, P. T.....Bemidji
‡Watson, S. W.....Royalton
Whittemore, D. D.....Bemidji
Will, C. B.....Bertha
Will, W. W.....Bertha
Wilson, V. O.....Minneapolis
‡Wingquist, C. G.....Crosby
Withrow, M. E.....International Falls

WABASHA COUNTY MEDICAL SOCIETY

Regular meetings, Spring and Fall
Annual meeting, first Thursday after first Monday in October
Number of Members: 16

President
‡Wellman, T. G.....Lake City
Secretary
Wilson, W. F.....Lake City

Bayley, E. C.....Lake City
Bouquet, B. J.....Wabasha

‡Bowers, R. N.....Lake City
†Cochrane, W. J.....Lake City
Collins, J. S.....Wabasha
†Dempsey, D. P.....Kellogg
Ellis, E. W.....Elgin
‡Flesche, B. A.....Lake City
Glabe, R. A.....Plainview

‡Holt, G. W.....Wabasha
Mahle, D. G.....Plainview
Ochsner, C. G.....Wabasha
Replogle, W. H.....Wabasha
Terrell, B. J.....Wabasha
‡Wellman, T. G.....Lake City
†Wilson, W. F.....Lake City

WASECA COUNTY MEDICAL SOCIETY

Regular meetings, none
Annual meeting, January
Number of Members: 8

President
Wadd, C. T.....Janesville
Secretary
Oeljen, S. C. G.....Waseca

Gallagher, B. J.....Waseca
‡Hottinger, R. C.....Janesville
McIntire, H. M.....Waseca
Oeljen, S. C. G.....Waseca

‡Olds, G. H.....Waseca
‡Spittler, R. O.....New Richland
Swenson, O. J.....Waseca
Wadd, C. T.....Janesville

WASHINGTON COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday in January, February, March, April, May, September, October November and December
Annual meeting second Tuesday in December
Number of Members: 19

President
Johnson, R. G.....Stillwater
Secretary
Boleyn, E. S.....Stillwater

Boleyn, E. S.....Stillwater
‡Carlson, R. E.....Stillwater
Haines, J. H.....Stillwater

Humphrey, W. R.....Stillwater
Johnson, R. G.....Stillwater
Josewski, R. J.....Stillwater
Kalinoff, D.....Stillwater
McCarten, F. M.....Stillwater
Mingo, F. E.....Hugo
‡Moir, W. W.....Stillwater
Poirier, J. A.....Forest Lake

‡Ruggles, G. McC.....Forest Lake
‡Samson, E. R.....Stillwater
Sherman, C. H.....Stillwater
Strand E. V.....Bayport
Stuhr, J. W.....Stillwater
Thompson, V. C...Marine-on-St. Croix
Van Meier, Henry.....Stillwater
Wilkinson, Stella L.....Newport

WATONWAN COUNTY MEDICAL SOCIETY

Regular meeting, at call
Annual meeting, December
Number of Members: 9

President
Bregel, F. L.....St. James
Secretary
Grimes, H. B.....Madelia

Bergman, O. B.....St. James
Bratrude, E. J.....St. James
Bregel, F. L.....St. James
Grimes, H. B.....Madelia

Hagen, O. E.....Butterfield
Hammar, L. M.....Two Harbors
McCarthy, W. J.....Madelia
Thompson, Albert.....St. James

WEST CENTRAL MINNESOTA MEDICAL SOCIETY

Big Stone, Pope, Stevens, and Traverse Counties
Regular meetings, second Wednesday, March, May, October, December
Annual meeting October
Number of Members: 30

President
Behmler, F. W.....Morris
Secretary
Linde, Herman.....Cyrus

Arneson, A. I.....Morris
Bates, B. V.....Browns Valley
Behmler, F. W.....Morris
Bergan, Otto.....Clinton
Bolsta, Charles.....Ortonville
Caine, C. E.....Morris

‡Dahle, M. B.....Glenwood
Doleman, N. F.....Tintah
Eberlin, E. A.....Glenwood
Elsey, E. McC.....Glenwood
Elsey, J. R.....Glenwood
Ewing, C. F.....Wheaton
Fitzgerald, E. T.....Morris
‡Garrow, D. M.....St. Paul
‡Giesen, A. F.....Starbuck
Jarvis, B. W.....Lowry
Johnson, H. E.....Ortonville
Karn, B. R.....Ortonville

Lindberg, A. L.....Wheaton
Linde, Herman.....Cyrus
Magnuson, A. E.....Graceville
‡Merrill, Robert.....Morris
McIver, B. A.....Lowry
Mooney, L. P.....Graceville
‡Muir, W. F.....Graceville
O'Donnell, D. M.....Ortonville
Oliver, C. I.....Graceville
Oliver, I. L.....Graceville
Ransom, M. L.....Hancock
Rydburg, W. C.....Brooten

WINONA COUNTY MEDICAL SOCIETY

Regular meetings, first Monday in January, April, July, October
Annual meeting, first Monday in January
Number of Members: 29

President
Risser, E. D.....Winona
Secretary
Meinert, A. E.....Winona

Benoit, F. T.....Winona
Bruder, V. F. J.....Winona
Christensen, E. E.....Winona
‡Hamlon, J. S.....St. Charles
Heise, Herbert.....Winona

Heise, W. F. C.....Winona
Heise, W. V.....Winona
Keyes, J. D.....Winona
Loomis, G. L.....Winona
‡Lundquist, C. W.....Winona
Mattison, P. A.....Winona
McLaughlin, E. M.....Winona
Meinert, A. E.....Winona
‡Meyer, W. M.....Winona
‡Nauth, B. S.....Winona
Neumann, C. A.....Winona
Page, R. L.....St. Charles

Risser, E. D.....Winona
Robbins, C. P.....Winona
‡Roemer, H. J.....Winona
‡Roth, F. D.....Lewiston
Satterlee, H. W.....Lewiston
Schaefer, Samuel.....Winona
Steiner, I. W.....Winona
Tweedy, G. J.....Winona
Tweedy, R. B.....Winona
Walker, G. H.....Winona
Wilson, R. H.....Winona
‡Younger, L. I.....Winona

WRIGHT COUNTY MEDICAL SOCIETY

Regular meetings, quarterly
Annual meeting, second Monday in October
Number of Members: 19

President
Peterson, O. L.....Cokato
Secretary
Catlin, J. J.....Buffalo

‡Anderson, W. P.....Buffalo
Bendix, L. H.....Annandale
Catlin, J. J.....Buffalo

Catlin, T. J.....Buffalo
Ellison, F. E.....Monticello
Greenfield, W. T.....Delano
Grundset, O. J.....Montrose
‡Guilfoile, P. J.....Delano
*Hansen, Rorbye.....Monticello
Harriman, L.....Howard Lake
‡Hart, W. E.....Monticello

Lee, J. L.....Watertown
Peterson, O. L.....Cokato
Phillips, A. E.....Delano
Ridgway, A. M.....Annandale
Roholt, C. L.....Waverly
Rolig, D. H.....Howard Lake
Swezey, B. F.....Buffalo
Thielen, R. D.....St. Michael
Thompson, Arthur.....Cokato

ALPHABETIC ROSTER

Key to Symbols: *Deceased; †Affiliate or Associate; ‡In Service

Aagaard, G. N., Jr.....Minneapolis
Aanes, A. M.....Red Wing
Abbott, C. B.....Springfield
Abbott, J. S.....St. Paul
Aborn, W. H.....Hawley
Abraham, A. L.....Duluth
Abramson, Milton.....Minneapolis
Adair, A. F., Jr.....St. Paul
Adams, B. S.....Hibbing
Adams, J. M.....Minneapolis
Adams, R. C.....Bird Island
Adams, R. C.....Rochester
Addy, E. R.....Gilbert
Adkins, C. M.....Thief River Falls
Adkins, G. H.....Pine River
Adson, A. W.....Rochester
Affeldt, D. E.....Kasson
Ahl, C. W.....Hibbing
Ahlfs, J. J.....Caledonia
Ahrens, A. E.....St. Paul
Ahrens, A. H.....St. Paul
Aita, J. A.....Rochester
Aitkens, H. B.....Le Center
Akester, Ward.....Marshall
Akins, W. M.....Eveleth
Albers, G. D.....Rochester
Alberts, M. W.....St. Paul
Albrecht, H. H.....Floodwood
Alden, J. F.....St. Paul
Alexander, F. H.....St. Paul
‡Alexander, H. A.....Minneapolis
‡Aling, C. A.....Minneapolis
Allen, C. C.....Austin
‡Allen, E. V. N.....Rochester
Allen, H. W.....Minneapolis
Allen, H. B.....Austin
Allison, R. G.....Minneapolis
Altnow, H. O.....Minneapolis
Alvarez, W. C.....Rochester
Amberg, Samuel.....Rochester
‡Ambrusko, J. S.....Rochester
Amundson, A. E.....Little Falls
Andersen, A. G.....Minneapolis
Andersen, S. C.....Minneapolis
†Anderson, B. M.....Rochester
‡Anderson, C. D.....Rochester
‡Anderson, C. L.....Duluth
Anderson, D. D.....Minneapolis
‡Anderson, D. P., Jr.....Austin
‡Anderson, E. D.....Minneapolis
‡Anderson, Earl M.....Rochester
‡Anderson, Edward M.....Lamberton
Anderson, E. R.....Minneapolis
Anderson, F. J.....Minneapolis
Anderson, H. R.....Deer River
Anderson, J. K.....Minneapolis
Anderson, K. W.....Minneapolis
Anderson, L. E.....Rochester
Anderson, M. J.....Rochester
‡Anderson, N. E.....Harmony
Anderson, O. W.....Luverne
Anderson, P. A.....Minneapolis
Anderson, R. E.....Willmar
Anderson, S. H.....Red Wing
‡Anderson, U. S.....Minneapolis
‡Anderson, W. E...Thief River Falls
‡Anderson, W. P.....Buffalo
Anderson, W. S.....Minneapolis
‡Andreassen, E. C.....Minneapolis
Andresen, K. D.....Minneapolis
Andrews, R. N.....Mankato
*Andrus, F. C.....Minneapolis
Arends, A. L.....Cambridge
‡Arey, S. L.....Excelsior
‡Arko, J. L.....Chisholm
‡Arlander, C. E.....Minneapolis
Arling, L. S.....Minneapolis
‡Arling, P. A.....Minneapolis
Armstrong, E. L.....Duluth
†Armstrong, J. M.....St. Paul
Arndt, H. W.....Detroit Lakes
Arneson, A. I.....Morris
Arnold, Ann W.....Minneapolis
Arnold, D. C.....Minneapolis
Arnold, E. W.....Adrian
Arnquist, A. S.....St. Paul
Arnson, J. M.....Benson
‡Arny, F. P.....Preston
Arvidson, C. G.....Minneapolis
‡Ashburn, F. S.....Rochester
Athens, A. G.....Duluth
Atwater, J. S.....Rochester
Aune, Martin.....Minneapolis
Aurand, W. H.....Minneapolis
Aurelius, J. R.....St. Paul
Ausman, C. F.....St. Paul
Ayres, G. T.....Ely

‡Babb, F. S.....Rochester
Bachnik, F. W.....Hibbing
Bacon, D. K.....St. Paul
†Bacon, L. C.....St. Paul
Badeaux, G. I.....Brainerd
Baggenstoss, A. H.....Rochester
‡Bagley, C. M.....Duluth
Bagley, Elizabeth C.....Duluth
Bagley, W. R.....Duluth
Bailey, H. B.....Fairmont
‡Bailey, R. B.....Fairmont
Bair, H. L.....Rochester
Baken, M. P.....Minneapolis
Baker, A. B.....Minneapolis
Baker, A. C.....Fergus Falls
Baker, A. T.....Minneapolis
Baker, E. L.....Minneapolis
‡Baker, G. S.....Rochester
Baker, H. R.....Hayfield
Baker, Looe.....Minneapolis
Baker, N. H.....Fergus Falls
Baker, R. L.....Hayfield
Bakkila, H. E.....Duluth
‡Balcome, M. M.....St. Paul
Baldigo, E. M.....Red Wing
Balfour, D. C.....Rochester
‡Balkin, S. G.....Minneapolis
‡Balmer, A. I.....Pipestone
Banner, E. A.....Rochester
†Barber, J. P.....Minneapolis
Bardon, Richard.....Duluth
Bargen, J. A.....Rochester
Barker, N. W.....Rochester
Barnes, A. R.....Rochester
‡Barnes, R. G., Jr.....Hastings
Barnett, J. M.....Cold Spring
Barney, L. A.....Duluth
Barr, L. C.....Albert Lea
‡Barr, R. N.....St. Paul
Barr, W. H.....Wells
Barrett, E. E.....Duluth
Barron, Moses.....Minneapolis
Barry, L. W.....St. Paul
Barsness, Nellie O. N.....St. Paul
Barton, R. L.....Rochester
Basinger, H. P.....Windom
Basinger, H. R.....Mountain Lake
Bass, G. W.....Minneapolis
Bates, B. V.....Browns Valley
‡Batty, J. L.....Hibbing
Baumgartner, F. H.....Albany
Baxter, S. H.....Minneapolis
Bayard, H. F.....Minneapolis
Bayley, E. C.....Lake City
Beach, Northrop.....Minneapolis
Beals, Hugh.....St. Paul
†Beard, A. H.....Minneapolis
Beard, Crowell.....Rochester
Becker, Arnetta M.....Minneapolis
‡Becker, F. T.....Duluth
Beckering, Gerrit.....Edgerton
‡Beckjord, P. R.....Willmar
‡Beckman, W. G.....Minneapolis
Bedford, E. W.....Minneapolis
Beech, R. H.....St. Paul
Beede, Ethel R.....Faribault
‡Beek, H. O.....St. Paul
‡Beer, J. J.....St. Paul
Behmler, F. W.....Morris
Behr, O. K.....Crookston
Beise, R. A.....Brainerd
Beizer, L. H.....Rochester
Bell, C. C.....St. Paul
†Bell, E. T.....Minneapolis
Belote, G. B.....Caledonia
‡Belzer, M. S.....Minneapolis
Bender, J. H.....Big Fork
Bendix, L. H.....Annandale
Benedict, W. L.....Rochester
Benepe, J. L.....St. Paul
Benesh, L. A.....Minneapolis
Benesh, N. G.....Minneapolis
Benjamin, A. E.....Minneapolis
‡Benjamin, E. G.....Minneapolis
‡Benjamin, H. G.....Minneapolis
Benjamin, W. G.....Pipestone
Benn, F. G.....Minneapolis
‡Bennett, J. K.....Rochester
Bennett, W. A.....Rochester
Bennion, P. H.....St. Paul
Benoit, F. T.....Winona
Benson, R. E.....Rochester
Bentley, N. P.....St. Paul
Benton, P. C.....Gibbon
Bepko, Marie K.....Cloquet
Berdez, G. L.....Duluth
Bergan, Otto.....Clinton
Berge, D. O.....Roseau

Bergen, C. T.....Bricelyn
Berger, A. G.....Minneapolis
‡Bergh, G. S.....Minneapolis
Bergh, L. N.....Montevideo
‡Berghs, L. V.....Owatonna
Bergman, O. B.....St. James
Bergquist, K. E.....Battle Lake
Berkman, D. M.....Rochester
Berkman, J. M.....Rochester
‡Berkwitz, N. J.....Minneapolis
Berlin, A. S.....Hallock
‡Berman, Reuben.....Minneapolis
Bernstein, W. C.....St. Paul
Bertelson, O. L.....Crookston
Bessesen, A. N., Jr.....Minneapolis
‡Bessesen, D. H.....Minneapolis
Bessesen, W. A.....Minneapolis
Beuning, J. B.....St. Cloud
Bianco, A. J.....Duluth
Bicek, J. F.....St. Paul
Bickel, W. H.....Rochester
Biedermann, Jacob..Thief River Falls
Bigelow, C. E.....Dodge Center
Billings, R. E.....Franklin
Binet, H. E.....Grand Rapids
Binger, H. E.....St. Paul
Binger, M. W.....Rochester
Birnberg, T. L.....St. Paul
Black, A. S., Jr.....Rochester
Black, B. M.....Rochester
*Black, William.....Mankato
Blaisdell, J. S.....Rochester
Blake, James.....Hopkins
‡Blake, James A.....Hopkins
Blakely, C. C.....Barnum
Blakey, A. R.....Osakis
Blanchard, H. G.....Fairmont
Bloedel, T. J.....Glencoe
Blomberg, W. R.....Princeton
Blumenthal, J. S.....Minneapolis
Blumenthal, L. S.....Rochester
‡Blumstein, Alex.....Minneapolis
‡Boardman, D. V.....Twin Valley
Bock, R. A.....St. Paul
Bockman, M. W. H.....Minneapolis
‡Bodaski, A. A.....Montgomery
Boeckmann, Egil.....St. Paul
Boehme, E. J.....Boston, Mass.
Boehrer, J. J.....Minneapolis
Bofenkamp, F. W.....Luverne
Bohl, G. W.....Ada
Boies, L. R.....Minneapolis
Bolender, H. L.....St. Paul
Boleyn, E. S.....Stillwater
Boline, C. A.....Battle Lake
Bolsta, Charles.....Ortonville
Boman, P. G.....Duluth
Boody, G. J., Jr.....Dawson
Booth, A. E.....Minneapolis
Boothby, W. M.....Rochester
Boreen, C. A.....Minneapolis
‡Borg, J. F.....St. Paul
Borgerson, A. H.....Long Prairie
Borgeson, E. J.....Minneapolis
Borman, C. N.....Minneapolis
Borowicz, L. A.....Minneapolis
Bosland, H. G.....Verndale
Bossert, C. S.....Mora
Bottolfson, B. T.....Moorhead
Bouma, L. R.....St. Paul
†Bouman, H. A. H.....Minneapolis
Bouquet, B. J.....Wabasha
Bowen, R. L.....Hibbing
‡Bowers, R. N.....Lake City
Bowing, H. H.....Rochester
Boyd, L. M.....Alexandria
Boyer, S. H.....Duluth
‡Boyer, S. H., Jr.....Duluth
Boynton, Ruth E.....Minneapolis
Boysen, Herbert.....Madelia
‡Boysen, J. E.....Pelican Rapids
Boysen, Peter.....Pelican Rapids
Braasch, W. F.....Rochester
Bradshaw, S. P.....Rochester
Brand, G. D.....St. Paul
Brand, W. A.....Redwood Falls
‡Branham, D. S.....Albert Lea
Branton, A. F.....Willmar
Branton, B. J.....Willmar
Bratrud, A. F.....Minneapolis
Bratrud, Edward....Thief River Falls
Bratrude, E. J.....St. James
Braun, O. C.....Nashwauk
Braverman, N. J.....Duluth
Bray, E. R.....St. Paul
‡Bray, K. E.....Park Rapids
Bray, P. N.....Duluth
Bray, R. B.....Biwabik

Bregel, F. L. ..... St. James
‡Brekke, H. J. ..... Minneapolis
Breslow, Lester ..... Rochester
Briggs, J. F. ..... St. Paul
Brigham, C. F. ..... St. Cloud
Brigham, F. T. ..... Watkins
Brindley, George V., Jr. ..... Rochester
Brink, A. A. ..... Baudette
‡Brink, D. M. ..... Isle
Broadie, T. E. ..... St. Paul
Broders, A. C. ..... Rochester
Brodie, W. D. ..... St. Paul
Broker, W. S. ..... Wadena
Brooks, C. N. ..... Minneapolis
Brown, A. E. ..... Rochester
Brown, A. H. ..... Pipestone
†Brown, E. D. ..... Paynesville
†Brown, E. I. ..... St. Paul
Brown, G. E., Jr. ..... Pine City
Brown, H. A. ..... Rochester
Brown, J. C. ..... St. Paul
Brown, J. R. ..... Rochester
Brown, L. L. ..... Crookston
‡Brown, M. H. ..... Rochester
‡Brown, P. W. ..... Rochester
‡Brown, S. P. ..... Minneapolis
Brown, W. D. ..... Minneapolis
Browne, H. C., Jr. ..... Rochester
Brownstone, Manuel ..... Sandstone
Bruder, V. F. J. ..... Winona
Brunsting, L. A. ..... Rochester
Brusegard, J. F. ..... Red Wing
‡Brutsch, G. C. ..... Minneapolis
Bryant, F. L. ..... Minneapolis
Bryson, J. C. ..... Rochester
‡Buchstein, H. F. ..... Minneapolis
Buck, F. H. ..... Shakopee
‡Buck, R. M. ..... Rochester
Buckley, R. P. ..... Duluth
Buie, L. A. ..... Rochester
‡Bulinski, T. J. ..... St. Paul
Bulkley, Kenneth ..... Minneapolis
Bunker, B. W. ..... Anoka
‡Burch, E. P. ..... St. Paul
Burch, F. E. ..... St. Paul
‡Burchell, H. B. ..... Rochester
Burdon, Phyllis J. ..... Rochester
Burkhart, R. J. ..... Rochester
‡Burlingame, D. A. ..... Minneapolis
Burnap, W. L. ..... Fergus Falls
Burns, F. M. ..... Milan
Burns, L. S. ..... So. St. Paul
Burns, M. A. ..... Milan
Burns, R. M. ..... St. Paul
Burton, C. G. ..... St. Paul
Buscher, J. C. ..... St. Cloud
Bushard, W. J. ..... Bird Island
Busher, H. H. ..... St. Paul
Butler, John ..... Minneapolis
Butler, J. K. ..... Carlton
‡Butt, H. R. ..... Rochester
Butturff, C. R. ..... Freeborn
Butzer, J. A. ..... Mankato
Buzzelle, L. K. ..... Minneapolis

Cable, M. L. ..... Minneapolis
Cabot, C. M. ..... Minneapolis
Cabot, V. S. ..... Minneapolis
Cady, L. H. ..... Minneapolis
‡Cain, C. L. ..... St. Paul
Caine, C. E. ..... Morris
Cairns, R. J. ..... Redwood Falls
‡Caldwell, H. W. ..... Rochester
Caldwell, J. P. ..... St. Paul
Calhoun, F. W. ..... Albert Lea
Call, J. D. ..... Rochester
Callahan, F. F. ..... Ah-Gwah-Ching
Callerstrom, G. W. ..... Minneapolis
Cameron, Isabell L. ..... Minneapolis
Cameron, J. H. ..... Erskine
‡Camp, J. D. ..... Rochester
Camp, W. E. ..... Minneapolis
‡Campbell, C. M., Jr. ..... Rochester
‡Campbell, D. C. ..... Rochester
‡Campbell, J. R. ..... Rochester
Campbell, L. M. ..... Minneapolis
Campbell, O. J. ..... Minneapolis
Canfield, W. W. ..... Preston
Cantwell, W. F. ..... International Falls
Cardle, A. E. ..... Minneapolis
‡Cardle, G. E. ..... Brainerd
Carey, J. B. ..... Minneapolis
Carley, W. A. ..... St. Paul
Carlson, C. E. ..... Aitkin
‡Carlson, R. E. ..... Stillwater
Carlson, J. V. ..... Westbrook
Carlson, Lawrence ..... Minneapolis
Carlson, L. T. ..... Minneapolis
Carman, J. E. ..... Detroit Lakes
Carmona, M. G. ..... Rochester
Caron, R. P. ..... Minneapolis
Carroll, W. C. ..... St. Paul
Carryer, H. M. ..... Rochester
Carstens, C. F. ..... Hibbing

‡Caspers, C. G. ..... Minneapolis
Catlin, J. J. ..... Buffalo
Catlin, T. J. ..... Buffalo
‡Cavanor, F. T. ..... Minneapolis
Ceder, E. T. ..... Rochester
‡Ceplecha, S. F. ..... Redwood Falls
Cervenka, C. F. ..... New Prague
†Chadbourn, A. G. ..... Heron Lake
Chadbourn, C. R. ..... St. Paul
‡Challman, S. A. ..... Minneapolis
Chambers, W. C. ..... Blue Earth
Chapman, A. S. ..... Rochester
Chapman, T. L. ..... Duluth
Chatterton, C. C. ..... St. Paul
*Cheney, E. L. ..... Duluth
Chermak, F. G. ..... International Falls
Chesley, A. J. ..... St. Paul
Chesley, Ward B. ..... Virginia
Christensen, B. H. ..... Rochester
‡Christensen, C. H. ..... Duluth
Christensen, E. E. ..... Winona
Christensen, E. P. ..... Two Harbors
Christenson, G. R. ..... Minneapolis
Christiansen, Andrew ..... St. Paul
Christianson, H. W. ..... Minneapolis
†Christie, G. R. ..... Long Prairie
†Christison, J. T. ..... St. Paul
‡Chunn, S. S. ..... Pipestone
Clagett, O. T. ..... Rochester
‡Clapp, Stewart ..... Duluth
Clark, F. F. ..... Duluth
Clark, H. B. ..... St. Cloud
‡Clark, H. B., Jr. ..... St. Paul
†Clark, H. S. ..... Minneapolis
Clark, L. W. ..... Spring Valley
Clarke, E. K. ..... St. Paul
‡Clarke, E. T. ..... Rochester
Clay, L. B. ..... Minneapolis
Claydon, H. F. ..... Red Wing
Claydon, L. E. ..... Red Wing
‡Cleaves, W. D. ..... Grand Rapids
Clement, J. B. ..... Lester Prairie
‡Clement, T. G. ..... Duluth
Clifford, G. W. ..... Alexandria
Clifton, T. A. ..... Chatfield
Clothier, E. F. ..... Elk River
†Cochrane, B. B. ..... St. Paul
‡Cochrane, R. F. ..... Minneapolis
†Cochrane, W. J. ..... Lake City
‡Coddon, W. D. ..... St. Paul
Cohen, S. S. ..... Oak Terrace
Colby, W. L. ..... St. Paul
Cole, J. G. ..... Redwood Falls
Cole, W. H. ..... St. Paul
†Collie, H. G. ..... St. Paul
Collins, A. N. ..... Duluth
†Collins, H. C. ..... Duluth
Collins, J. S. ..... Wabasha
‡Colp, E. A. ..... Robbinsdale
Colvin, A. R. ..... St. Paul
Combacker, L. C. ..... Fergus Falls
Comfort, M. W. ..... Rochester
Condit, W. H. ..... Minneapolis
‡Condon, W. B. ..... Rochester
†Conner, H. M. ..... Rochester
Connor, C. E. ..... St. Paul
‡Cook, C. K. ..... St. Paul
Cook, E. N. ..... Rochester
Cook, J. M. ..... Staples
‡Coombs, C. H. ..... Cass Lake
‡Coombs, J. M. ..... Cass Lake
Cooney, H. C. ..... Princeton
‡Cooper, C. C. ..... St. Paul
Cooper, M. D. ..... Winnebago
‡Cooper, Talbert ..... Rochester
Cooper, W. L. ..... Rochester
Cooperman, H. O. ..... Minneapolis
Corbett, J. F. ..... Minneapolis
Corbitt, R. W. ..... Rochester
Corniea, A. D. ..... Minneapolis
†Corrigan, J. E. ..... Spooner
Cosgriff, J. A. ..... Olivia
Counseller, V. S. ..... Rochester
Countryman, R. S. ..... St. Paul
Covell, W. W. ..... St. Peter
‡Coventry, M. B. ..... Rochester
Coventry, W. A. ..... Duluth
‡Coventry, W. D. ..... Duluth
†Cowern, E. W. ..... N. St. Paul
‡Cragg, R. W. ..... Rochester
Craig, C. C. ..... International Falls
‡Craig, W. McK. ..... Rochester
Cranmer, R. R. ..... Minneapolis
‡Cranston, R. W. ..... Minneapolis
Creevy, C. D. ..... Minneapolis
‡Creighton, R. H. ..... Minneapolis
‡Crenshaw, J. L. ..... Rochester
Cress, P. J. ..... Ellsworth
Crewe, J. E. ..... Rochester
Critchfield, L. R. ..... St. Paul
Crombie, F. J. ..... North St. Paul
Cronwell, B. J. ..... Austin
Crow, E. R. ..... Ah-Gwah-Ching
Crump, J. W. ..... St. Paul

Culligan, J. M. ..... St. Paul
Cumming, H. A. ..... Minneapolis
‡Cummings, D. W. ..... Rushford
‡Cunningham, B. P. ..... Rochester
‡Cunningham, C. B. ..... Virginia
Curtin, J. F. ..... Minneapolis
Curtis, R. A. ..... Le Center
‡Cusick, P. L. ..... Rochester
Cutts, George ..... Minneapolis

Dack, L. G. ..... St. Paul
Dady, E. E. ..... Minneapolis
Dahl, E. O. ..... Minneapolis
Dahl, G. A. ..... Mankato
Dahl, J. A. ..... Minneapolis
‡Dahle, M. B. ..... Glenwood
Dahleen, H. C. ..... Rochester
Daniel, D. H. ..... Minneapolis
Daniel, L. M. ..... Minneapolis
Danielson, K. A. ..... Litchfield
Danielson, Lennox ..... Litchfield
Darling, J. P. ..... Rochester
†Daugherty, E. B. ..... Marine-on-St. Croix
Daugherty, G. W. ..... Rochester
Daugherty, L. E. ..... St. Paul
Davies, L. T. ..... Rochester
Davies, R. J. ..... Nopeming
Davis, A. C. ..... Rochester
†Davis, Herbert ..... St. Paul
Davis, I. G. ..... Rushford
Davis, J. C. ..... Minneapolis
‡Davis, L. F. ..... Wadena
Davis, L. T. ..... Wadena
Davis, R. D. ..... Clearbrook
Davis, T. C. ..... Wadena
†Davis, William ..... St. Paul
Day, Lois A. ..... Rochester
Dearing, W. H., Jr. ..... Rochester
De Boer, Hermanus ..... Edgerton
DeCourcey, D. M. ..... St. Paul
Dedolph, Karl ..... St. Paul
†Dedolph, T. H. ..... Minneapolis
Delavan, P. A. ..... St. Paul
‡Delmore, J. L., Jr. ..... Roseau
Delmore, J. L. ..... Roseau
del Plaine, C. W. ..... Minneapolis
‡Demo, P. W. ..... Wells
‡Demong, C. V. ..... Rochester
†Dempsey, D. P. ..... Kellogg
Denman, A. V. ..... Mankato
Dennis, Clarence ..... Minneapolis
Derauf, B. I. ..... St. Paul
Derifield, R. S. ..... Crookston
Desjardins, A. U. ..... Rochester
Devereaux, T. J. ..... Wayzata
Dewey, D. H. ..... Owatonna
Dickson, F. H., Jr. ..... Proctor
Dickson, T. H. ..... St. Paul
Diehl, H. S. ..... Minneapolis
Diessner, H. D. ..... Minneapolis
Dittman, G. C. ..... St. Paul
Dixon, C. F. ..... Rochester
Dobyns, B. M. ..... Rochester
Dochat, G. R. ..... Rochester
Dockerty, M. B. ..... Rochester
Doleman, N. F. ..... Tintah
‡Doman, V. W. ..... Lakefield
Doms, H. C. A. ..... Slayton
Donaldson, C. S. ..... Foley
Donohue, P. F. ..... St. Paul
Donovan, D. L. ..... Albert Lea
Doolittle, L. E. ..... Duluth
Dordal, John ..... Sacred Heart
Dorge, R. I. ..... Minneapolis
Dornblaser, H. B. ..... Minneapolis
Dorsey, G. C. ..... Minneapolis
Dovre, C. M. ..... St. Paul
‡Dowidat, R. W. ..... Minneapolis
Downing, G. C. ..... Rochester
Dowswell, W. J. ..... Kerkhoven
Doxey, G. L. ..... Minneapolis
‡Doyle, G. C. ..... Duluth
Doyle, L. O. ..... Minneapolis
Drake, C. B. ..... St. Paul
Drake, C. R. ..... Minneapolis
†Drake, F. A. ..... Lanesboro
‡Drapiewski, J. F. ..... Rochester
Dredge, H. P. ..... Sandstone
Drill, H. E. ..... Hopkins
Drips, Della G. ..... Rochester
Drought, W. W. ..... Fergus Falls
‡Dry, T. J. ..... Rochester
Dubbe, F. H. ..... New Ulm
Du Bois, J. F. ..... Sauk Centre
Duff, E. R. ..... Minneapolis
Dukelow, D. A. ..... Minneapolis
Dumas, A. G. ..... Minneapolis
Duncan, J. W. ..... Moorhead
Dungay, N. S. ..... Northfield
Dunlap, D. L. ..... Rochester
Dunlap, E. H. ..... Minneapolis
Dunn, G. R. ..... Minneapolis
Dunn, J. N. ..... St. Paul
Duryea, W. M. ..... Minneapolis

Dutton, C. E.....Minneapolis
Dvorak, B. A.....Minneapolis
Dwan, P. F.....Minneapolis
Dworak, A. F.....St. Paul
Dworsky, S. D.....Minneapolis
Dysterheft, A. F.....Gaylord

Earl, George .....St. Paul
Earl, J. R.....St. Paul
Earl, Robert.....St. Paul
East, John.....Northome
Eaton, L. M.....Rochester
Eaves, G. B.....Wabasso
Eberlin, E. A.....Glenwood
Eckdale, J. E.....Lyle
Eckhardt, C. L.....Austin
Eckman, P. F.....Duluth
Eckman, R. J.....Duluth
Ederer, J. J.....Mahnomen
Edlund, Gustaf.....St. Paul
Edwards, J. W.....St. Paul
Edwards, T. J.....St. Paul
Egan, Sherman .....Rochester
Eginton, C. T.....St. Paul
Ehni, G. J.....Rochester
Ehrenberg, C. J.....Minneapolis
Ehrlich, S. P.....Minneapolis
Eich, Matthew.....Minneapolis
Eiler, John.....Park Rapids
Eisenstadt, D. H.....Minneapolis
Eisenstadt, W. S.....Minneapolis
Eitel, G. D.....Minneapolis
Ekblad, J. W.....Duluth
Eklund, E. J.....Norwood
Elias, F. J.....Duluth
Elkins, E. C.....Rochester
Ellingson, A. R.....Detroit Lakes
Elliott, W. S.....Virginia
Ellis, E. W.....Elgin
Ellison, D. E.....Minneapolis
Ellison, F. E.....Monticello
Elsey, E. M.....Glenwood
Elsey, J. R.....Glenwood
Ely, O. S.....So. St. Paul
Emanuel, K. W.....Duluth
Emerson, E. C.....St. Paul
Emerson, G. F.....Rochester
Emmerson, W. S.....Mayer
Emmett, J. L.....Rochester
Emond, A. J.....Farmington
Endress, E. K.....St. Paul
Engberg, E. J.....Faribault
Engdahl, F. W.....Mankato
Engh, Sigfred.....Jackson
Englehart, P. C.....Minneapolis
Engstrand, O. J.....Minneapolis
Engstrom, G. F.....Belgrade
Enroth, O. E.....White Bear Lake
Eppard, R. M.....Cloquet
Erich, J. B.....Rochester
Erickson, A. O.....Ivanhoe
Erickson, C. O.....Rochester
Erickson, D. J.....Rochester
Erickson, Eskil.....Halstad
Erickson, E. W.....Rochester
Erickson, R. E.....Hector
Erickson, R. F.....Minneapolis
Ericson, R. M.....Minneapolis
Ericson, Swan, ...Le Sueur
Ernest, G. C. H.....So. St. Paul
Erskine, G. M.....Grand Rapids
Ertel, E. Q.....Ellendale
Eshelby, E. C.....St. Paul
Esser, John .....Perham
Esser, O. J.....New Ulm
Estrem, C. O.....Fergus Falls
Estrem, R. D.....Fergus Falls
Estrem, T. A.....Hibbing
Eusterman, G. B.....Rochester
Evans, C. H., Jr.....Rochester
Evans, E. T.....Minneapolis
Evans, L. M.....Sauk Rapids
Evans, R. D.....Minneapolis
Evarts, A. B.....Rochester
Ewens, H. B.....Virginia
Ewing, C. F.....Wheaton
Eyres, T. E.....Pequot

Faber, J. E.....Rochester
Faber, W. M.....Rochester
Fahey, E. W.....St. Paul
Fahlund, G. T. R.....Rochester
Fahr, G. E.....Minneapolis
Fait, R. V.....Little Falls
Fankboner, A. V.....Buhl
Fansler, W. A.....Minneapolis
Farrish, R. C.....Sherburn
‡Farsht, I. J.....Minneapolis
Fawcett, A. M.....Renville
Fawcett, K. R.....Duluth
Fawcett, R. M.....Rochester
Feeney, J. M.....Minneapolis
‡Feinstein, J. Y.....Grove City
Feldman, F. M.....Rochester
‡Fellows, M. F.....Duluth
Fenger, E. P. K.....Oak Terrace
‡Ferguson, F. F.....Detroit, Mich.
Ferguson, J. C.....St. Paul
Ferguson, W. C.....Walnut Grove
‡Ferguson, W. J., Jr.....Rochester
Ferris, D. O.....Rochester
Fesenmaier, O. B.....New Ulm
Fesler, H. H.....St. Paul
Fetterly, Warren.....Minneapolis
‡Feuling, J. C.....Bovey
Field, A. H.....Farmington
Figi, F. A.....Rochester
Fink, L. W.....Minneapolis
Fink, W. H.....Minneapolis
Fischer, Albert .....Rochester
Fischer, M. McC.....Duluth
‡Fishback, C. F.....Rochester
Fisher, I. I.....Ceylon
‡Fisketti, Henry.....Duluth
†Fitzgerald, D. F.....Minneapolis
Fitzgerald, E. T.....Morris
Fitzsimons, W. E.....Brainerd
Fjeldstad, C. A.....Minneapolis
Flanagan, H. F.....St. Paul
Fleming, A. S.....Minneapolis
Fleming, T. N.....St. Cloud
‡Flesche, B. A.....Lake City
‡Flinn, J. H.....Rochester
Flinn, T. E.....Redwood Falls
Flom, M. G.....Zumbrota
Foerster, J. M.....Rochester
Fogarty, C. W., Jr.....Rochester
Fogarty, C. W.....St. Paul
Fogelberg, E. J.....St. Paul
Foker, L. W.....Minneapolis
Foley, F. E. B.....St. Paul
Folken, F. G.....Albert Lea
Forbes, R. S.....Duluth
Ford, B. C.....Marshall
Ford, W. H.....Minneapolis
‡Forney, R. A.....Rochester
Foshager, H. T.....Clara City
Foss, E. L.....Rochester
‡Foster, M. A.....Rochester
Foster, T. N.....Rochester
Foster, W. K.....Minneapolis
‡Fowler, L. H.....Minneapolis
Franchere, F. W.....Lake Crystal
Francis, D. W.....Morristown
Frane, D. B.....Minneapolis
‡Frank, J. E.....Marshall
Fredericks, G. M.....Minneapolis
Frederickson, Alice C.....Willmar
Frederickson, G. U. Y.....Willmar
Fredlund, M. L.....Minneapolis
Freeman, C. D.....St. Paul
Freeman, G. H.....St. Peter
Freeman, J. P.....Albert Lea
Freeman, W. L.....St. Cloud
‡Freeman, W. N.....Perham
Friedman, L. L.....St. Paul
Freligh, W. P.....Albert Lea
Fricke, R. E.....Rochester
Friedell, Aaron.....Minneapolis
Friedell, George.....Ivanhoe
Friesleben, William.....Sauk Rapids
Frisch, F. P.....Willmar
Fritsche, Albert.....New Ulm
‡Fritsche, C. J.....New Ulm
Fritsche, T. R.....New Ulm
Fritz, W. L.....St. Paul
‡Fritzell, K. E.....Minneapolis
Froats, C. W.....St. Paul
Frost, E. H.....Willmar
Frost, H. T.....Wadena
Frost, J. B.....Minneapolis
Fugina, G. R.....Mankato
Fuller, Alice H.....Minneapolis
‡Funk, V. K.....Oak Terrace

Gaarde, F. W.....Rochester
Gager, E. C.....St. Paul
Gaida, J. B.....St. Cloud
Gaines, E. C.....Buffalo Lake
Gallagher, B. J.....Waseca
‡Galloway, J. B.....Minneapolis
Gambill, E. E.....Rochester
Gamble, J. W.....Albert Lea
Gamble, P. M.....Albert Lea
Gammell, J. H.....Minneapolis
Garbrecht, A. W.....St. Paul
Gardiner, D. G.....St. Paul
Gardner, E. L.....Minneapolis
Gardner, V. H.....Fairmont
Gardner, W. P.....Anoka
Garlock, A. V.....Bemidji
Garlock, D. H.....Bemidji
‡Garrow, D. M.....St. Paul
‡Garten, J. L.....Minneapolis
Geer, E. K.....St. Paul
Gehlen, J. N.....St. Paul
Geist, G. A.....St. Paul
Gelbach, P. D.....Rochester
Gendron, J. F. X.....Grand Rapids
Gerber, M. P.....Brainerd
Germo, Charles.....Balaton
Ghent, C. H.....St. Paul
Ghormley, R. K.....Rochester
Ghostley, Mary C.....Puposky
Gibbons, F. C.....Comfrey
Gibbs, E. C.....St. Paul
Giere, J. C.....Minneapolis
Giere, R. W.....Minneapolis
Giere, S. W.....Benson
‡Giesen, A. F.....Starbuck
†Giessler, P. W.....Minneapolis
‡Giffin, H. M.....Rochester
Giffin, H. Z.....Rochester
‡Gifford, B. L.....Long Prairie
Gilbert, Harry.....Minneapolis
Gilbert, M. G. .....Minneapolis
†Gilfillan, J. S.....St. Paul
Gilkey, S. E.....St. Paul
Gilles, F. L.....Minneapolis
‡Gillespie, D. R.....Rochester
Gillespie, M. G.....Duluth
‡Gilman, L. C.....Atwater
†Gilmore, Rowland.....Bemidji
Gingold, B. A.....Minneapolis
Ginsberg, William.....St. Paul
Girvin, R. B.....Minneapolis
Glabe, R. A.....Plainview
Glenn, D. L.....Rochester
Glomset, D. A.....Rochester
Glover, R. P.....Rochester
Goblirsch, A. P.....Sleepy Eye
‡Goehrs, G. H.....St. Cloud
Goehrs, H. W.....St. Cloud
Golberg, M. L.....Minneapolis
Goldberg, I. M.....Minneapolis
Goldish, D. R.....Duluth
Goldman, T. I.....Minneapolis
‡Goldner, M. Z.....Minneapolis
Goltz, E. V.....St. Paul
Good, C. A., Jr.....Rochester
Good, H. D.....Minneapolis
Goodman, C. E.....Virginia
Gordon, P. E.....Minneapolis
‡Gore, H. R.....Rochester
Gorenflo, Leila A.....Ah-Gwah-Ching
Gorsuch, M. T.....Rochester
‡Goss, H. C.....Glencoe
Goss, Martha D.....Glencoe
Gosslee, G. L.....Moorhead
‡Gowan, L. R.....Duluth
‡Grabow, J. J.....Duluth
‡Graham, F. M.....Rochester
‡Graham, R. J.....Rochester
Grahek, J. P.....Ely
Grant, H. W.....St. Paul
Gratzek, Thomas.....St. Paul
‡Grau, R. K.....St. Paul
Grave, Floyd.....Minneapolis
‡Graves, R. B.....Red Wing
‡Graves, W. N.....Duluth
Gray, F. D.....Marshall
Gray, H. K.....Rochester
Gray, R. C.....Minneapolis
‡Gray, R. F.....Marshall
‡Greathouse, J. D.....Minneapolis
Green, R. G.....Minneapolis
Greene, L. F.....Rochester
Greenfield, W. T.....Delano
Griffin, P. J.....Fertile
‡Grimes, B. P.....St. Peter
Grimes, H. B.....Madelia
Grimes, Marian.....Minneapolis
Grise, W. B.....Austin
Griswold, F. E.....Hoffman
Grogan, J. S.....Wadena
Gronvall, P. R.....Minneapolis
Groschupf, T. P. E.....Bemidji
Grose, F. N.....Clarissa
Gruenhagen, A. P.....St. Paul
Grundset, O. J.....Montrose
‡Guernsey, D. E.....Rochester
‡Guilfoile, P. J.....Delano
Gullixson, Andrew.....Albert Lea
Gully, R. J.....Cambridge
Gunderson, N. A.....Minneapolis
Gushurst, E. G.....Minneapolis
Gustason, H. T.....Minneapolis
Guthrie, R. F.....Rochester

‡Haavik, J. E.....St. Paul
Habein, H. C.....Rochester
Haberman, Emil.....Osakis
‡Hackie, E. A.....Hallock
†Hacking, F. H.....Minneapolis
‡Haes, J. E.....Vernon Center
*Hagaman, G. K.....St. Paul
Hagen, O. E.....Butterfield
Hagen, O. J.....Moorhead
‡Hagen, W. S.....Minneapolis
†Haggard, G. D.....Minneapolis
Haight, G. G.....Audubon
Haines, J. H.....Stillwater

Haines, S. F.....Rochester
‡Haisten, A. S.....Rochester
Halenbeck, P. L.....St. Cloud
Hall, A. R.....St. Paul
Hall, B. E.....Rochester
Hall, H. B.....Minneapolis
Hall, H. H.....St. Paul
Hall, J. M.....Minneapolis
Halladay, G. J.....Brainerd
Hallberg, C. A.....Minneapolis
Hallberg, O. E.....Rochester
Hallenbeck, D. F.....Rochester
Hallenbeck, G. A.....Rochester
‡Haller, W. M.....Bemidji
‡Hallock, Philip .....Minneapolis
Halloran, W. H.....Jackson
Halpern, D. J.....Brewster
Halpin, J. E.....Rush City
Hamel, A. L.....Minneapolis
Hamlin, G. B.....Minneapolis
‡Hamlon, J. S.....St. Charles
Hammar, L. M.....Two Harbors
Hammermeister, T. F.....New Ulm
‡Hammerstad, L. M.....Minneapolis
Hammes, E. M.....St. Paul
Hammes, E. M., Jr.....Rochester
Hammond, A. J. H.....Minneapolis
Hammond, J. F.....St. Paul
Haney, C. L.....Duluth
Hankerson, R. G.....Minnesota Lake
Hannah, H. B.....Minneapolis
Hanover, R. D.....Littlefork
Hansen, C. O.....Minneapolis
Hansen, E. W.....Minneapolis
Hansen, Olga S.....Minneapolis
*Hansen, Rorbye.....Monticello
‡Hanson, A. M.....Faribault
Hanson, E. O.....Cloquet
Hanson, E. C.....New York Mills
Hanson, H. B. .....St. Paul
Hanson, H. J.....Minneapolis
Hanson, H. V.....Minneapolis
Hanson, Lewis .....Frost
Hanson, M. B.....Minneapolis
Hanson, N. O.....Rochester
Hanson, W. A. H.....Minneapolis
Happe, L. J.....Minneapolis
Hardman, Sue C.....Rochester
Hargraves, M. M.....Rochester
‡Harley, R. D.....Rochester
Harlow, H. D. .....Virginia
Harmon, G. E.....St. Paul
Harper, S. B.....Rochester
‡Harri, E. J.....Carlton
Harriman, Leonard.....Howard Lake
Harrington, C. D.....Wayzata
Harrington, F. E.....Minneapolis
Harrington, S. W.....Rochester
Harris, C. N.....Hibbing
Harrison, P. W.....Worthington
‡Hart, V. L.....Minneapolis
‡Hart, W. E.....Monticello
Hartfiel, W. F.....St. Paul
Hartley, E. C.....St. Paul
Hartman, H. R.....Rochester
‡Hartmann, C. M.....Fairfax
‡Hartnagel, G. F.....Red Wing
Hartung, E. H.....Claremont
†Hartzell, T. B.....Minneapolis
‡Harvey, George, Jr.....Rochester
Haskell, A. D.....Alexandria
Hassett, M. F.....St. Paul
Hassett, R. G.....Mankato
Hastings, D. R.....Minneapolis
Hatch, W. E.....Duluth
‡Hathaway, S. J.....Proctor
‡Hauge, E. T.....Minneapolis
Hauge, M. I.....Clarkfield
‡Haugen, J. A.....Minneapolis
Hauser, V. P.....St. Paul
Hausmann, P. F.....Rochester
Havel, H. W.....Jordan
‡Havel, T. E.....Blue Earth
Haven, W. K.....Minneapolis
Havens, F. Z.....Rochester
Havens, J. G. W.....Austin
†Haverfield, Addie R.....Minneapolis
Hawkins, W. J.....Rochester
Hawkinson, J. P.....Crosby
‡Hawkinson, R. P.....Minneapolis
Hayes, J. M.....Minneapolis
Hayes, M. F.....Nashwauk
Hays, A. T.....Minneapolis
‡Head, D. P.....Minneapolis
Head, G. D.....Minneapolis
Healy, R. T.....Pierz
†Heath, A. C.....Stillwater
‡Hebbel, Robert.....Minneapolis
Hebeisen, M. B.....Chaska
Heck, F. J.....Rochester
‡Heck, W. W.....St. Paul
Hedback, A. E.....Minneapolis
Hedberg, G. A.....Nopeming

Hedemark, H. H...Thief River Falls
Hedenstrom, F. G.....St. Paul
Hedenstrom, L. H.....Cambridge
Hedin, R. F.....Red Wing
Heersema, P. H.....Rochester
Hegge, O. H.....Austin
Hegge, R. S.....Austin
Heiam, W. C.....Cook
Heiberg, E. A.....Fergus Falls
Heiberg, O. M.....Worthington
Heilman, Charles.....Fargo, N. D.
Heilman, Dorothy M. H.....Rochester
Heilman, F. R.....Rochester
Heim, R. R.....Minneapolis
Heimark, J. J.....Fairmont
Heinrich, W. A.....Rochester
‡Heinz, Ivy B.....Hastings
‡Heinz, L. H.....Hastings
Heise, Herbert .....Winona
Heise, W. F. C.....Winona
Heise, W. V.....Winona
‡Helferty, J. K.....Tracy
Helland, G. M.....Spring Grove
Helland, J. W.....Spring Grove
Helmholz, H. F.....Rochester
Helseth, H. K.....Thief River Falls
Hempstead, B. E.....Rochester
†Hemstead, Werner.....Fergus Falls
‡Hench, P. S.....Rochester
Henderson, A. J. G.....Kiester
Henderson, J. W.....Rochester
Henderson, M. S.....Rochester
Hendrickson, J. F.....Minneapolis
‡Hendrickson, R. R.....Lake Park
Hengstler, W. H.....St. Paul
Henney, W. H.....McIntosh
Henrikson, E. C.....Minneapolis
†Henry, C. E.....Kirksville, Mo.
Henry, C. J.....Milaca
Henry, M. O.....Minneapolis
Hensel, C. N.....St. Paul
Henslin, A. E.....Le Roy
Herbert, W. L.....Minneapolis
Herbst, R. F.....Wykoff
Herman, Samuel.....St. Paul
Hermanson, P. E.....Hendricks
Heron, R. C.....St. Paul
Herrell, W. E.....Rochester
Herrmann, E. T.....St. Paul
Hertel, G. E.....Austin
Hertz, M. J.....St. Paul
Hertzog, A. J.....Minneapolis
Hewitt, Edith S.....Rochester
†Hewitt, R. M.....Rochester
†Heyerdale, O. C.....Rochester
‡Heyerdale, W. W.....Rochester
Heyerman, O. T.....Warren
Higgins, G. K.....Oak Terrace
Higgins, J. H.....Minneapolis
‡Higginson, J. F.....Rochester
Higgs, W. W.....Park Rapids
Hilding, A. C.....Duluth
Hilger, A. W.....St. Paul
Hilger, D. D.....St. Paul
‡Hilger, J. A.....St. Paul
Hilger, L. A.....St. Paul
Hilger, L. D.....St. Paul
Hill, Eleanor J.....Minneapolis
Hill, F. E.....Duluth
‡Hill, J. R.....Rochester
‡Hillis, S. J.....Minneapolis
Hinckley, R. G.....Minneapolis
Hines, E. A., Jr.....Rochester
Hiniker, L. P.....St. Paul
Hiniker, P. J.....Le Sueur
Hinshaw, H. C.....Rochester
Hirschboeck, F. J.....Duluth
*Hirschfelder, A. D.....Minneapolis
†Hirschfield, M. S.....Duluth
Hirshfield, F. R.....Minneapolis
Hitchings, W. S.....Lakefield
Hoagland, P. I., Jr.....Rochester
Hoaglund, A. W.....Minneapolis
†Hobbs, C. A.....Minneapolis
Hochfilzer, J. J.....St. Paul
Hodapp, R. J.....Willmar
Hodge, S. V.....Minneapolis
Hodgson, Jane E.....Rochester
Hoeper, P. G.....Mankato
Hoff, Alfred .....St. Paul
Hoff, H. O.....Duluth
Hoffbauer, F. W.....Minneapolis
Hoffert, H. E.....Minneapolis
Hoffman, M. H.....St. Paul
Hoffman, R. A.....Minneapolis
Hoffman, W. L.....Minneapolis
Hoidale, A. D.....Tracy
†Holcomb, J. T...Marine-on-St. Croix
Holcomb, O. W.....St. Paul
†Holl, P. M.....Minneapolis
Hollands, W. H.....Fisher
Holm, H. H.....Glencoe
†Holm, P. F.....Wells
‡Holmberg, C. J.....Minneapolis

Holmberg, L. J.....Canby
Holmen, R. W.....St. Paul
Holmes, A. E.....Rush City
Holmstrom, C. H.....Warren
‡Holt, G. W.....Wabasha
Holt, J. E.....St. Paul
Holtan, Theodore.....Waterville
Holzapfel, F. C.....Minneapolis
‡Honke, R. W.....Proctor
*Hopkins, E. O.....Rochester
‡Hopkins, G. W.....St. Paul
Hopping, R. A.....Rochester
Horton, B. T.....Rochester
‡Hottinger, R. C.....Janesville
Houkom, Bjarne.....Minneapolis
Houkom, S. S.....Duluth
House, Z. E.....Cass Lake
‡Houston, D. M.....Park Rapids
Hovde, Rolf.....Winthrop
‡Hovland, M. L.....Minneapolis
Howard, M. A.....St. Paul
Howard, M. I.....Mankato
Howard, W. S.....St. Paul
Howell, L. P.....Rochester
‡Hoyer, L. J.....Windom
Hoyne, R. M.....Rochester
Hubbard, O. E.....Brainerd
Hubin, E. G.....Deerwood
Hudec, E. R.....Echo
Hudson, G. E.....Minneapolis
Huenekens, E. J.....Minneapolis
‡Hughes, T. J.....Minneapolis
Hullsiek, H. E.....St. Paul
‡Hullsiek, R. B.....St. Paul
Hultkrans, J. C.....Minneapolis
Hultkrans, R. E.....Minneapolis
Humphrey, E. W.....Moorhead
Humphrey, W. R.....Stillwater
Hunt, A. B.....Rochester
Hunt, R. C.....Fairmont
‡Hunt, R. S.....Fairmont
Hunte, A. F.....Globe, Ariz.
‡Hunter, O. B., Jr.....Rochester
Hurd, Annah.....Minneapolis
Hursh, M. M.....Hibbing
Hurwitz, M. M.....Rochester
‡Hutchinson, C. J.....Minneapolis
Hutchinson, Dorothy W...Oak Terrace
Hutchinson, Henry.....Moose Lake
Huxley, F. R.....Faribault
Hymes, Charles.....Minneapolis
Hynes, J. E.....Minneapolis

Ide, A. W.....St. Paul
‡Idstrom, L. G.....Minneapolis
Ikeda, Kano.....St. Paul
Ingebrigtson, E. K. G.....Moorhead
Ingerson, C. A.....St. Paul
Irvine, H. G.....Minneapolis
Iverson, H. A.....Rochester
Iverson, R. M.....Rochester
‡Ivie, J. McK.....Rochester

Jackman, R. J.....Rochester
†Jackson, C. M.....Minneapolis
‡Jacobs, D. L.....Willmar
Jacobs, G. C.....Fergus Falls
Jacobs, J. C.....Willmar
Jacobson, C. E., Jr.....Rochester
Jacobson, Clarence.....Chisholm
Jacobson, C. W....Thief River Falls
‡Jaeck, J. L.....Minneapolis
Jamieson, E. F.....Brainerd
Jarvis, B. W.....Lowry
Jennings, Mary H...Los Angeles, Calif.
Jensen, A. M.....Browntown
Jensen, H. C.....Minneapolis
Jensen, R. A.....Minneapolis
Jensen, T. J.....Duluth
Jesion, J. W.....St. Paul
Jessico, C. M.....Duluth
Johanson, W. G.....St. Paul
Johnson, A. B.....Minneapolis
Johnson, A. E.....Red Wing
Johnson, A. E.....Minneapolis
Johnson, A. M.....St. Paul
Johnson, A. R.....Isanti
†Johnson, C. E.....Pine River
Johnson, C. E.....St. Paul
‡Johnson, C. R.....Rochester
Johnson, C. M.....Dawson
Johnson, D. L.....Little Falls
‡Johnson, D. W.....Fairmont
Johnson, E. W.....Bemidji
‡Johnson, E. W.....Minneapolis
Johnson, Evelyn V.....St. Louis Park
Johnson, H. A.....Minneapolis
Johnson, H. C.....North Mankato
Johnson, H. E.....Ortonville
*Johnson, H. P.....Fairmont
Johnson, H. P.....Harmony
Johnson, Hans.....Kerkhoven
Johnson, J. A.....St. Paul
Johnson, J. A.....Minneapol

ohnson, J. R.....Rochester
ohnson, Julius.....Minneapolis
Johnson, J. W.....Kerkhoven
Johnson, K. E.....Duluth
Johnson, M. R.....Red Wing
Johnson, N. A...Santa Monica, Calif.
ohnson, N. P.....Minneapolis
ohnson, N. T.....Minneapolis
ohnson, O. H.....Redwood Falls
ohnson, O. V.....Fergus Falls
ohnson, Olga H.....Moorhead
ohnson, P. C.....Tyler
ohnson, R. A.....Minneapolis
ohnson, R. B.....Lanesboro
Johnson, R. E.....Minneapolis
ohnson, R. E.....Worthington
ohnson, R. G.....Stillwater
Johnson, T. H...San Francisco, Calif.
Johnson, V. M.....Dawson
ohnson, W. E.....Morgan
Johnson, Y. T.....Minneapolis
ohnsrud, L. W.....Hibbing
ohnston, L. F.....Slayton
olin, F. M.....Bovey
olin, R. V.....Grand Rapids
ones, A. W.....Red Wing
ones, E. M.....St. Paul
Jones, H. W., Jr.....Minneapolis
ones, O. H.....Madison Lake
ones, R. N.....St. Cloud
ones, W. R.....Minneapolis
ordan, L. S.....Granite Falls
osewich, Alexander.....Minneapolis
osewski, R. J.....Stillwater
Joss, C. S.....Rochester
oyce, G. L.....Rochester
udd, D. B.....Rochester
udd, E. S., Jr.....Rochester
udd, W. H.....Minneapolis
uergens, H. M.....Belle Plaine
uers, E. H.....Red Wing
uliar, R. O.....St. Clair
Jump, W. C.....Kasson
urdy, M. J.....Minneapolis
ust, H. J.....Hastings

aasa, L. J.....Albert Lea
alin, O. T.....Minneapolis
alinoff, Demeter.....Stillwater
allestad, L. L.....Hutchinson
amman, G. R.....St. Paul
amp, B. A.....Albert Lea
Kannary, E. L.....St. Paul
Kanne, C. W.....Faribault
apernick, J. S.....Rochester
Kaplan, D. H.....St. Paul
Karleen, C. I.....Tracy
arlstrom, A. E.....Minneapolis
arn, B. R.....Ortonville
Karn, J. F.....St. Paul
Karon, I. M.....St. Paul
asper, E. M.....St. Paul
ath, R. H.....Woodlake
Katzovitz, Hyman.....St. Paul
aufman, E. J.....Appleton
aufman, W. C.....Appleton
Kauvar, A. J.....Rochester
eating, F. R., Jr.....Rochester
eefe, R. E.....St. Paul
eith, H. M.....Rochester
eith, N. M.....Rochester
eithahn, E. E.....Kimball
elby, G. M.....Minneapolis
Kelly, A. C.....Duluth
elly, J. V.....St. Paul
elly, P. H.....St. Paul
elsey, C. G.....Hinckley
emp, A. F.....Mankato
emp, M. W.....Moose Lake
enefick, E. V.....St. Paul
ennedy, C. C.....Minneapolis
ennedy, Jane F.....Minneapolis
ennedy, R. L. J.....Rochester
ennedy, W. A.....St. Paul
enyon, T. J.....St. Paul
epler, E. J.....Rochester
erkhof, A. C.....Minneapolis
erlan, Irvin.....Washington, D. C.
Kern, M. C.....Freeport
ernohan, J. W.....Rochester
ertesz, Geza.....Minneapolis
esting, Herman.....St. Paul
Kettlewell, R. B.....Sauk Center
eyes, J. D.....Winona
ibbe, O. A.....Minneapolis
ierland, P. E.....Alexandria
Kierland, R. R.....Rochester
iernan, P. C.....Rochester
iesling, I. H.....Coleraine
ilbride, E. A.....Worthington
ilbride, J. S.....Canby
immel, G. C., Jr.....Red Wing
King, E. A.....Minneapolis
King, Frances W.....Oak Terrace
King, G. L.....St. Paul
King, H. T.....Minneapolis
Kingsbury, E. M.....Moose Lake
Kinsella, T. J.....Minneapolis
Kirk, G. P.....East Grand Forks
Kirklin, B. R.....Rochester
Kirklin, O. L.....Rochester
Kistler, A. J.....Minneapolis
Kistler, C. M.....Minneapolis
Klein, Harry.....Duluth
Klein, H. N.....St. Paul
‡Klein, J. C.....Shakopee
Klima, W. W.....Stewart
‡Klinkenberg, R. B.....Rochester
Kloos, E. K.....Rochester
Knapp, F. N.....Duluth
Knapp, M. E.....Minneapolis
Knauff, M. K.....St. Paul
Knight, E. G.....Swanville
Knight, R. R.....Minneapolis
Knight, R. T.....Minneapolis
‡Knutson, G. A.....Greenbush
Koch, F. L. P.....St. Paul
Koelsche, G. A.....Rochester
Koepcke, G. M.....Minneapolis
‡Koepsell, A. A. H.....St. Paul
Kohlbry, C. O.....Duluth
Kohler, D. W.....St. Joseph
Kolars, J. J.....Le Center
Koller, H. M.....Minneapolis
Koller, L. R.....Minneapolis
Koop, S. H.....Richmond
Korchik, J. P.....Minneapolis
Kortsch, F. P.....Prior Lake
‡Koskela, L. E.....Sebeka
Kostick, W. R.....Fertile
Kotchevar, F. R.....Eveleth
Koucky, R. W.....Minneapolis
‡Kozberg, Oscar.....Moose Lake
Kraft, Peter.....Duluth
‡Krause, C. W.....Fairmont
‡Kreilkamp, B. L.....Rochester
Kreuzer, T. C.....Marshall
‡Krieser, A. E.....Boyd
Krusen, F. H.....Rochester
Kucera, F. J.....Hopkins
‡Kucera, L. J.....Lonsdale
Kucera, S. T.....Lonsdale
Kucera, W. J.....Minneapolis
Kugler, A. A.....St. Paul
Kuhlmann, August.....Melrose
Kurtin, H. J.....Blooming Prairie
Kusske, A. L.....New Ulm
Kvale, W. F.....Rochester
Kvitrud, Gilbert.....St. Paul

‡La Bree, R. H.....Duluth
Laird, A. T.....Nopeming
Lajoie, J. M.....Minneapolis
Lamb, H. L.....Little Falls
Lander, H. H.....Rochester
Lang, L. A.....Minneapolis
Langenderfer, F. V.....St. Paul
Lannin, J. C.....Mabel
Lapierre, A. P.....Minneapolis
Lapierre, J. T.....Minneapolis
‡Large, H. R.....Rochester
‡Larrabee, W. F., Jr.....Rochester
Larsen, C. L.....St. Paul
‡Larsen, F. W.....Minneapolis
Larsen, O. O.....Detroit Lakes
Larson, Arnold.....Detroit Lakes
Larson, C. M.....Minneapolis
Larson, Eva-Jane.....St. Paul
Larson, J. T.....Lake Wilson
Larson, L. J.....Bagley
‡Larson, L. M.....Minneapolis
Larson, L. M.....Oak Terrace
Larson, M. H.....Nicollet
Larson, P. N.....Minneapolis
Latchem, C. W.....Rochester
‡Lauer, D. J.....St. Paul
La Vake, R. T.....Minneapolis
Lax, M. H.....St. Paul
Laymon, C. W.....Minneapolis
Lazar, H. L.....Minneapolis
Leahy, Bartholomew.....St. Paul
Leavenworth, R. O.....St. Paul
†Leavitt, H. H.....Minneapolis
Lebowske, J. A.....Minneapolis
‡Leck, P. C.....Austin
Leddy, E. T.....Rochester
Lee, H. M.....Minneapolis
Lee, H. W.....Brainerd
Lee, J. L.....Watertown
*Lee, W. A.....Fergus Falls
Lee, W. N.....Madison
Leemhuis, G. H.....Aitkin
‡Lehnhoff, H. J., Jr.....Rochester
Leibold, H. H.....Parkers Prairie
‡Leick, R. M.....St. Paul
‡Leighton, Robert.....Evansville
Leitch, Archibald.....St. Paul
Leitch, N. M.....Warroad
Leland, H. R.....Minneapolis
‡Leland, J. A. C., Jr.....Minneapolis
Lemon, W. S.....Rochester
‡Lenander, M. E.....St. Peter
Lenarz, A. J.....Browerville
Lenont, C. B.....Virginia
Lenz, J. R.....Morton
Lenz, O. A.....Minneapolis
Leonard, L. J.....Minneapolis
Leonard, Samuel.....Minneapolis
Leopard, B. A.....Albert Lea
Lepak, F. J.....Duluth
Lepak, J. A.....St. Paul
†Lerche, William.....Cable, Wis.
Leven, N. L.....St. Paul
Levin, B. G.....St. Paul
Levinson, J. P.....Rochester
Levitt, G. X.....St. Paul
Lewis, A. J.....Henning
Lewis, C. B.....St. Cloud
Lexa, F. J.....Lonsdale
Libert, J. N.....St. Cloud
Lichtman, A. L.....Rochester
Lick, C. L.....St. Paul
Liedloff, A. G.....Mankato
‡Lien, R. J.....Rochester
Liffrig, W. W.....Red Wing
Lightbourn, E. L.....St. Paul
Lilleberg, N. J.....St. Paul
Lillehei, E. J.....Robbinsdale
Lillie, H. I.....Rochester
‡Lillie, J. C.....Rochester
Lima, L. R.....Montevideo
Lind, C. J.....Minneapolis
‡Lindahl, W. W.....Rochester
Lindberg, A. C.....Minneapolis
Lindberg, A. L.....Wheaton
‡Lindberg, V. L.....Minneapolis
Linde, Herman.....Cyrus
‡Lindgren, R. C.....Minneapolis
Lindley, S. B.....Fergus Falls
Lindquist, R. H.....Minneapolis
Linner, H. P.....Minneapolis
*Linton, W. B.....Minneapolis
‡Lippman, E. S.....Minneapolis
Lippman, H. S.....St. Paul
Lippmann, E. W.....Hutchinson
‡Lipschultz, Oscar.....Minneapolis
Lipscomb, P. R.....Rochester
Litchfield, J. T.....Minneapolis
‡Litman, A. B.....Minneapolis
Litman, S. N.....Duluth
‡Little, A. G., Jr.....Rochester
†Little, W. J.....St. Paul
Litzenberg, J. C.....Minneapolis
*Lloyd, H. J.....Mankato
†Lochead, D. C.....Rochester
Logan, A. H.....Rochester
Logan, G. B.....Rochester
Logefeil, R. C.....Minneapolis
Lohmann, J. G.....Jasper
‡Loken, S. M.....St. Paul
Loken, Theodore.....Ada
Lommen, P. A.....Austin
Long, G. C.....Rochester
†Long, Jesse.....Minneapolis
Loofbourrow, E. H.....Keewatin
Loomis, E. A.....Minneapolis
Loomis, G. L.....Winona
Love, F. A.....Carlos
Love, J. G.....Rochester
‡Love, W. R.....Rochester
‡Lovelace, W. R.....Rochester
‡Lovelady, S. B.....Rochester
Lovering, Joseph.....Rochester
Lovett, Beatrice R.....Oak Terrace
‡Lovshin, L. L.....Wausau, Wis.
Lowe, E. R.....So. St. Paul
Lowe, T. A.....So. St. Paul
Lowry, Elizabeth C.....Minneapolis
Lowry, Thomas .....Minneapolis
Luckey, C. A.....Rochester
Luden, Georgine.....Victoria, Canada
‡Lueck, A. G.....Rochester
*Luedtke, G. H.....Fairmont
Lufkin, C. D.....Northfield
‡Lufkin, N. H.....Minneapolis
Lund, C. J. T.....Fergus Falls
Lund, W. J.....Staples
Lundberg, Ruth I.....Minneapolis
‡Lundblad, R. A.....Minneapolis
‡Lundblad, S. W.....Minneapolis
Lundgren, A. C.....Minneapolis
Lundgren, Olive A.....Oakland, Calif.
Lundholm, A. M.....St. Paul
‡Lundquist, C. W.....Winona
Lundquist, E. F.....Minneapolis
Lundy, J. S.....Rochester
Lyght, C. E.....New York, N. Y.
Lynam, Frank .....Duluth
Lynch, F. W.....St. Paul
Lynch, M. J.....Minneapolis

Lynch, R. C.....Rochester
Lynde, O. G.....Thief River Falls
Lysne, Henry.....Minneapolis
‡Lysne, Myron.....Minneapolis

MacCarty, C. S.....Rochester
†MacCarty, W. C.....Rochester
MacDonald, A. E.....Minneapolis
MacDonald, D. A.....Minneapolis
‡Macey, H. B.....Rochester
Macfarlane, P. H.....Chisholm
Mach, F. B.....Minneapolis
‡Mack, J. J.....Chicago, Ill.
‡MacKay, H. J.....Seattle, Wash.
MacKinnon, D. C.....Minneapolis
Macklin, W. E., Jr.....Litchfield
‡MacLean, A. R.....Rochester
‡MacMillan, D. G.....Triumph
Macnie, J. S.....Minneapolis
‡MacRae, G. C.....Duluth
Madden, J. F.....St. Paul
‡Madland, R. S.....Fairfax
Maeder, E. C.....Minneapolis
Maertz, W. F.....New Prague
‡Magath, T. B.....Rochester
Magney, F. H.....Duluth
Magnusen, A. E.....Graceville
Mahle, D. G.....Plainview
Mahowald, Aloys.....Albany
Maitland, D. P.....Jackson
Maitland, E. T.....Jackson
Maland, C. O.....Minneapolis
Malerich, J. A.....Shakopee
Malmstrom, J. A.....Virginia
Manley, J. R.....Duluth
Manlove, F. R.....Rochester
†Mann, F. C.....Rochester
Manning, J. J.....Rochester
†Manson, F. M.....Worthington
†Marcley, W. J.....Minneapolis
Mariette, E. S.....Oak Terrace
Mark, D. B.....Minneapolis
‡Mark, Hilbert.....Minneapolis
Marking, G. H.....Osseo
‡Marks, R. W.....St. Paul
Marr, G. E.....Rochester
‡Marsh, O. M.....Litchfield
Martin, D. L.....So. St. Paul
Martin, G. M.....Rochester
Martin, T. P.....Arlington
Martin, W. C.....Duluth
Martineau, J. L.....St. Paul
Martinson, C. J.....Wayzata
‡Marvin, C. P.....Rochester
‡Mason, J. A.....International Falls
Masson, D. M.....Rochester
Masson, J. C.....Rochester
†Matchan, G. R.....Minneapolis
Matthews, Justus.....Minneapolis
Mattill, P. M.....Oak Terrace
Mattison, P. A.....Winona
‡Mattison, R. E.....Minneapolis
‡Mattson, A. D.....Atwater
Mattson, C. H.....St. Paul
Mattson, H. A. N.....Minneapolis
Maxeiner, S. R.....Minneapolis
May, W. H.....Minneapolis
‡Mayne, R. M.....Duluth
‡Mayo, C. W.....Rochester
‡Maytum, C. K.....Rochester
McBroom, D. E.....Cambridge
‡McCaffrey, F. J.....Minneapolis
McCain, D. L.....St. Paul
McCall, C. H.....Rochester
McCallig, J. J.....Rochester
McCann, D. F.....Bemidji
McCarten, F. M.....Stillwater
‡McCarthy, Donald.....Minneapolis
McCarthy, J. J.....St. Paul
McCarthy, W. J.....Madelia
McCarthy, W. R.....St. Paul
McCartney, J. S.....Minneapolis
McCarty, P. D.....Ely
McClanahan, J. H...White Bear Lake
McClanahan, T. S...White Bear Lake
McCloud, C. N., Jr.....Rochester
*McComb, C. F.....Duluth
†McCoy, Mary K.....Duluth
‡McCrimmon, H. P.....Minneapolis
McDaniel, Orianna.....Minneapolis
McDonald, A. L.....Duluth
McDonald, J. R.....Rochester
McDowell, J. P.....St. Cloud
McEachern, C. G.....Rochester
‡McElligott, E. W.....Breckenridge
McElmeel, E. F.....Pipestone
‡McEnaney, C. T.....Owatonna
McEwan, Alexander.....St. Paul
McFarland, A. H.....Minneapolis
McGandy, R. F.....Minneapolis
McGeary, G. E.....Minneapolis
McGroarty, J. J.....Easton
McGuigan, H. T.....Red Wing
McHaffie, O. L.....Duluth

McInerny, M. W.....Minneapolis
McIntire, H. M.....Waseca
McIntyre, J. A.....Owatonna
McIver, B. A.....Lowry
McKaig, C. B.....Pine Island
McKelvey, J. L.....Minneapolis
McKenna, J. K.....Austin
McKenna, M. J.....Grand Rapids
McKenzie, C. H.....Minneapolis
McKeon, J. O.....Montgomery
McKinlay, C. A.....Minneapolis
McKinley, J. C.....Minneapolis
McKinney, F. S.....Minneapolis
McLane, Evelyn G.....Jackson
McLane, W. O.....Perham
†McLaren, Jennette M.....Minneapolis
McLaughlin, E. M.....Winona
McLennan, C. E.....Minneapolis
McLeod, J. L.....Grand Rapids
McMahon, L. H.....Breckenridge
McMahon, M. J.....Green Isle
McNeary, D. J.....Rochester
McNutt, J. R.....Duluth
McPheeters, H. O.....Minneapolis
†McQuarrie, Irvine.....Minneapolis
Mead, C. H.....Duluth
Meade, J. R.....St. Paul
Mears, B. J.....St. Paul
Mears, R. F.....Northfield
‡Medelman, J. P.....St. Paul
Meinert, A. E.....Winona
Meland, E. L.....Minneapolis
Melby, Benedik.....Blooming Prairie
Mellby, O. F.....Thief River Falls
Meller, R. L.....Minneapolis
Melzer, G. R.....Lyle
Mercil, W. F.....Crookston
Merkert, C. E.....Minneapolis
Merkert, G. L.....Minneapolis
†Merrill, Elisabeth.....Minneapolis
‡Merrill, Robert.....Morris
Merriman, L. L.....Duluth
Merritt, W. A.....Rochester
Mesker, G. H.....Olivia
Messler, J. D.....Rochester
Metcalfe, R. M.....Rochester
Meyer, A. A.....Melrose
Meyer, A. J.....Minneapolis
Meyer, E. L.....Minneapolis
Meyer, F. C.....Kenyon
‡Meyer, J. O.....Grand Rapids
Meyer, P. F.....Faribault
‡Meyer, W. M.....Winona
Meyerding, E. A.....St. Paul
Meyerding, H. W.....Rochester
Meyers, W. C.....Rochester
Michael, J. C.....Minneapolis
‡Michel, H. H.....Minneapolis
Michelson, H. E.....Minneapolis
Mickelson, J. C.....Mankato
Miller, E. W.....St. Peter
‡Miller, Harold E.....Minneapolis
‡Miller, Hugo E.....Minneapolis
Miller, J. C.....Minneapolis
Miller, J. R., Jr.....Rochester
Miller, R. C.....Rochester
Miller, V. I.....Mankato
Miller, W. A.....New York Mills
Mills, J. L.....Winnebago
Milton, J. S.....Minneapolis
‡Minge, R. K.....Clarkfield
Mingo, F. E.....Hugo
‡Minkler, J. E.....Virginia
Minsky, A. A.....Minneapolis
Minty, Earl W.....Duluth
Mitby, I. L.....Aitkin
Mitchell, E. C.....Minneapolis
Mitchell, R. S.....Grand Meadow
Moberg, C. W.....Detroit Lakes
Moe, J. H.....Minneapolis
Moe, R. J.....Duluth
Moe, Thomas.....Moose Lake
Moen, J. K., Jr.....Minneapolis
Moersch, F. P.....Rochester
Moersch, H. J.....Rochester
Moga, J. A.....St. Paul
‡Moir, W. W.....Stillwater
Molander, H. A.....St. Paul
‡Mollers, T. P.....Mountain Iron
Monahan, R. H.....International Falls
Monroe, P. B.....Cloquet
‡Monserud, N. O.....Cloquet
‡Monson, E. M.....Minneapolis
‡Monson, L. J.....Canby
Montgomery, Hamilton.....Rochester
Mooney, L. P.....Graceville
‡Moos, D. J.....Minneapolis
Moquin, Marie A.....St. Paul
More, C. W.....Eveleth
Morehead, D. E.....Owatonna
Moren, Edward.....Minneapolis
‡Moren, L. A.....St. Paul
Morgan, H. O.....Amboy
Moriarty, Berenice.....St. Paul

Moriarty, Cecile R.....St. Pau
Mork, A. H.....Anok
Mork, B. O., Jr.....Worthingto
Mork, B. O., Sr.....Worthingto
Mork, F. E.....Anok
Morley, G. A.....Crooksto
Morlock, C. G.....Rochest
Morrison, A. W.....Minneapoli
Morrison, Charlotte J.....Minneapoli
†Morrissey, F. B.....St. Pa
Morrow, J. J.....Austi
Morse, M. P.....Le Ro
Morse, R. W.....Minneapoli
Morsman, L. W.....Hibbin
Mosby, M. E.....Long Prairi
Moses, Joseph, Jr.....Northfiel
Moses, R. R.....Kenyo
‡Mouritsen, G. J.....Fergus Fall
‡Mousel, L. H.....Rochest
Mueller, R. F.....Two Harbor
Mueller, Selma C.....Dulut
‡Muir, W. F.....Gracevill
Muller, R. T.....St. Pa
‡Mulligan, A. M.....Brainer
‡Murphy, E. P.....Minneapoli
Murphy, I. J.....Minneapoli
‡Murphy, J. E.....Marshal
Murphy, M. E.....Rochest
Murray, N. A.....Rochest
Murray, R. A.....Rochest
‡Murray, R. A.....Aitki
Musachio, N. F.....Fole
‡Musgrove, J. E.....Rochest
Mussey, Mary E.....Rochest
Mussey, R. D.....Rochest
‡Musty, N. J.....Minneapoli
Myers, J. A.....Minneapoli
Myre, C. R.....Paynesvill

‡Naegeli, A. E.....St. Pau
Naegeli, Frank.....Fergus Fall
Nagel, H. D.....Waconi
‡Naslund, A. W.....Minneapoli
Nass, H. A.....Mabe
‡Nauth, B. S.....Winon
Nay, R. M.....Rochest
Neal, J. M.....Minneapoli
Neal, J. M.....Rochest
Neale, R. M.....Rochest
Nealy, D. E.....Adria
Neary, R. P.....Minneapoli
‡Neel, H. B.....Albert Le
Neff, W. S.....Virgini
Nehring, J. P.....Presto
Nelson, E. H.....Chisholm
Nelson, E. J.....Owatonn
Nelson, E. N.....Minneapoli
†Nelson, H. S.....Excelsio
‡Nelson, K. L.....Montgomer
Nelson, L. A.....St. Pa
‡Nelson, L. M.....Minneapoli
‡Nelson, L. S.....Hibbin
‡Nelson, M. C.....Minneapoli
Nelson, M. S.....Granite Fall
Nelson, N. H.....Minneapoli
Nelson, N. P.....Brainer
‡Nelson, O. L. N.....Minneapoli
Nelson, R. A.....Fergus Fall
‡Nelson, R. L.....Dulut
Nelson, W. I.....Minneapoli
Nelson, W. O. B.....Fergus Fall
‡Nesheim, M. O.....Emmon
Nessa, C. B.....St. Clou
Nester, H. D.....Rochest
Neumaier, Arthur.....Glenco
Neumann, C. A.....Winon
New, G. B.....Rochest
‡Newell, F. W.....St. Pa
Newhart, Horace.....Minneapol
Nichols, A. E.....St. Pa
Nichols, D. R.....Rochest
Nicholson, M. A.....Dulut
‡Nielsen, A. M.....Northfiel
Nilson, H. J.....North Mankat
Ninneman, N. N.....Waconi
Nissen, A. S.....Dulut
Noble, J. F.....St. Pa
‡Noble, J. L.....St. Pa
‡Noonan, W. J.....Minneapoli
Norberg, C. E.....Cloqu
Nordin, G. T.....Minneapol
Nordland, Martin.....Minneapol
Nordman, W. F.....Mo
Norman, J. F.....Crooksto
Norris, N. T.....Caledoni
Northrup, W. F., Jr.....Rochest
Noth, H. W.....Minneapoli
Novak, E. E.....New Pragu
‡Nuebel, C. J.....St. Pa
Nuessle, W. G.....Springfiel
Nuetzman, A. W.....Faribau
Nutting, R. E.....Dulut
Nydahl, M. J.....St. Pa
Nye, Katherine A.....St. Pa
Nye, Lillian L.....St. Pa

ygren, W. T.....Braham
ylander, E. G.....Minneapolis

berg, C. M.....Minneapolis
O'Brien, W. A.....Minneapolis
O'Brien, W. M.....St. Paul
chsner, C. G.....Wabasha
O'Connor, L. J.....St. Paul
del, H. M.....Rochester
'Donnell, D. M.....Ortonville
'Donnell, J. E.....Minneapolis
eljen, S. C. G.....Waseca
erting, Harry.....St. Paul
Ogden, Warner.....St. Paul
hage, Justus, Jr.....St. Paul
'Hanlon, J. A.....Lindstrom
Ohnstad, J. L.....McIntosh
Olds, G. H.....Waseca
O'Leary, J. H.....Staples
'Leary, P. A.....Rochester
liver, C. I.....Graceville
liver, I. L.....Graceville
lmanson, E. G.....St. Peter
lsen, A. M.....Rochester
lsen, E. G.....Minneapolis
lsen, R. L.....St. Paul
'son, A. C.....Minneapolis
lson, A. E.....Duluth
'son, A. O.....Duluth
lson, C. A.....St. Paul
Olson, C. J.....Belle Plaine
lson, D. C.....Gaylord
lson, E. A.....Pine Island
lson, F. A.....Minneapolis
Olson, G. E.....West Concord
lson, J. D.....Rochester
lson, L. M.....Chisago City
lson, O. A.....Minneapolis
Olson, R. G.....Minneapolis
lson, S. W.....Rochester
nsgard, L. K.....Houston
ppegaard, C. L.....Crookston
ppegaard, M. O.....Crookston
ppen, E. G.....Minneapolis
'Reilley, B. E.....St. Paul
Ormond, D. T.....Waconia
stergren, E. W.....St. Paul
tto, H. C.....Frazee
uellette, A. J.....St. Paul
uld, C. L.....Minneapolis
Owens, W. A.....Montevideo
wre, Oscar.....Minneapolis

age, R. L.....St. Charles
Paine, J. R.....Minneapolis
Palen, B. J.....Minneapolis
almer, C. F.....Albert Lea
almer, H. A.....Blackduck
almer, W. L.....Albert Lea
Palmerton, E. S.....Albert Lea
Pankratz, P. J.....Mountain Lake
aradis, W. G.....Crookston
Parker, O. W.....Ely
arker, R. L.....Rochester
arker, W. H.....Chisholm
arkhill, Edith M.....Rochester
arson, E. I.....Duluth
arson, L. R.....Elbow Lake
arson, Lillian B.....Elbow Lake
arsons, J. G.....Crookston
arsons, R. L.....Monterey
asek, A. W.....Cloquet
asser, A. A.....Olivia
Patch, O. B.....Duluth
Patterson, H. D.....Anoka
Patterson, S. A.....Duluth
atterson, W. E.....Minneapolis
atterson, W. L.....Fergus Falls
Pattison, D. H.....Rochester
Paulson, E. C.....Elbow Lake
Paulson, D. L.....Rochester
aulson, J. A.....Rochester
aulson, T. S.....Fergus Falls
ayne, J. H.....Rochester
earsall, R. P.....Virginia
earson, B. F.....Shakopee
earson, D. J.....Rochester
earson, F. R.....St. Paul
earson, L. O.....Warroad
earson, M. M.....St. Paul
eck, L. D.....Hastings
eck, L. R.....Hastings
edersen, A. H.....St. Paul
edersen, R. C.....Duluth
Pederson, R. M.....Minneapolis
emberton, J. deJ.....Rochester
Pender, J. W.....Rochester
enhall, F. W.....Morton
enk, E. L.....Springfield
enn, G. E.....Mankato
ennie, D. F.....Duluth
Pennington, R. E.....Rochester
eppard, T. A.....Minneapolis

‡Perlman, E. C.....Minneapolis
Perry, C. G.....St. Paul
‡Perry, T. T.....Rochester
Person, J. P.....Alden
Pertl, A. L.....Canby
Peters, G. A.....Rochester
Petersen, J. R.....Minneapolis
Petersen, M. C.....Rochester
Petersen, P. C.....Braham
‡Petersen, R. T.....Minneapolis
Petersen, Thorvald.....Minneapolis
Peterson, A. A.....Mora
Peterson, D. B.....St. Paul
Peterson, E. N.....Virginia
Peterson, H. O.....St. Paul
Peterson, H. W.....Minneapolis
‡Peterson, J. H.....Duluth
Peterson, J. L. E.....St. Paul
Peterson, N. P.....Minneapolis
Peterson, O. H.....Minneapolis
Peterson, O. L.....Cokato
Peterson, P. E.....Minneapolis
Peterson, R. A.....Vesta
Peterson, V. N.....St. Paul
Peterson, W. C.....Minneapolis
‡Peterson, W. G.....Rochester
Peterson, W. H.....Minneapolis
Petit, L. J.....Minneapolis
Petkevich, F. M.....Red Lake Falls
Petraborg, H. T.....Aitkin
‡Pewters, J. T.....Minneapolis
Peyton, W. T.....Minneapolis
Pfuetze, K. H.....Cannon Falls
Pfunder, M. C.....Minneapolis
‡Phalen, G. S.....Rochester
Phelps, K. A.....Minneapolis
Phillips, A. E.....Delano
Phillips, W. H.....Jordan
Pierce, C. H.....Wadena
Pierson, R. F.....Slayton
Piper, M. C.....Rochester
Piper, W. A.....Mountain Lake
Platou, E. S.....Minneapolis
‡Plimpton, N. C., Jr.....Rochester
Plondke, F. J.....St. Paul
Plowman, E. T.....Marble
Plummer, W. A.....Rochester
Pogue, R. E.....Watertown
‡Pohl, J. F.....Minneapolis
Poirier, J. A.....Forest Lake
‡Pollard, D. W.....Minneapolis
Polley, H. F.....Rochester
Pollock, D. K.....Minneapolis
Pollock, L. W.....Rochester
Polmeteer, F. E.....Rochester
Polzak, J. A.....Minneapolis
‡Ponterio, J. E.....Shakopee
Pool, T. L.....Rochester
Poore, J. C.....Isle
Popovich, S. J.....Rochester
Popp, W. C.....Rochester
Poppe, F. H.....Minneapolis
‡Potek, David.....International Falls
Potter, R. B.....Minneapolis
Potthoff, C. J.....Minneapolis
Power, J. E.....Duluth
Powers, F. H.....Rochester
Prangen, A. D.....Rochester
Pratt, F. J.....Minneapolis
Pratt, J. H., Jr.....Rochester
Preine, I. A.....Minneapolis
Preisinger, J. W.....Renville
Prendergast, H. J.....St. Paul
‡Preston, F. W.....Rochester
Preston, L. F.....Rochester
Preston, P. J.....Minneapolis
Prickman, L. E.....Rochester
‡Priest, R. E.....Minneapolis
Priestley, J. T.....Rochester
Prim, J. A.....Minneapolis
‡Prins, L. R.....Albert Lea
‡Proeschel, R. K.....Willmar
Proffit, W. E.....Minneapolis
Proshek, C. E.....Minneapolis
Proudfit, C. H.....Rochester
Pruitt, R. D.....Rochester
Pugh, D. G.....Rochester
Purves, G. H.....Lake Benton
Puumala, R. H.....Cloquet

Quanstrom, V. E.....Brainerd
‡Quello, R. O. B.....Minneapolis
†Quinby, T. F.....Minneapolis
Quist, H. W.....Minneapolis

Raadquist, C. S.....Hibbing
Radabaugh, R. C.....Hastings
Radcliffe, James, Jr.....Rochester
Raetz, S. J.....Maple Lake
Raihala, John.....Virginia
Raiter, R. F.....Cloquet
‡Ramsey, R. M.....St. Paul
†Ramsey, W. R.....St. Paul
Randall, A. M.....Ashby

Randall, L. M.....Rochester
Ransom, M. L.....Hancock
Rasmussen, R. C.....St. Paul
‡Rasmussen, W. C.....Rochester
Raszkowski, H. J.....Rochester
†Ratcliffe, J. J.....Aitkin
Rathbun, C. A.....St. Cloud
Raymond, J. H.....Canby
Rea, C. E.....St. Paul
Reed, C. A.....Minneapolis
Reeve, E. A. T.....Elbow Lake
Reff, A. R.....Crookston
Regnier, E. A.....Minneapolis
Reichelderfer, C. F.....Staples
‡Reif, H. J.....St. Paul
†Reineke, G. F.....New Ulm
†Reiter, H. W.....Shakopee
Rempel, D. D.....Lester Prairie
Replogle, W. H.....Wabasha
‡Rewbridge, A. G.....Minneapolis
Reynolds, J. S.....Minneapolis
Rice, C. O.....Minneapolis
‡Rice, H. G.....Moorhead
Rice, H. R.....Roseau
Richards, E. T. F.....St. Paul
Richards, W. B.....St. Cloud
‡Richardson, F. S.....Minneapolis
Richardson, H. E.....St. Paul
‡Richardson, R. J.....Rushford
Richardson, W. E.....Rushford
Richdorf, L. F.....Minneapolis
Rick, P. F. W.....St. Paul
Ridgway, A. M.....Annandale
Rieke, W. W.....Wayzata
Rigler, L. G.....Minneapolis
Rigos, F. J.....Rochester
Rimer, E. W.....Breckenridge
Ringle, O. F.....Walker
‡Rinkey, Eugene.....Redwood Falls
Ripple, R. J.....New London
Risch, R. E.....Minneapolis
Risser, A. F.....Stewartville
Risser, E. D.....Winona
*Ritchie, H. P.....St. Paul
‡Ritchie, W. P.....St. Paul
Ritt, A. E.....St. Paul
Rivers, A. B.....Rochester
‡Rizer, D. K.....Minneapolis
Rizer, R. I.....Minneapolis
Roan, C. M.....Minneapolis
Robb, E. F.....Minneapolis
Robbins, C. P.....Winona
Robbins, O. F.....Minneapolis
‡Roberts, L. J.....Minneapolis
Roberts, O. W.....Owatonna
‡Roberts, S. W.....Minneapolis
Roberts, T. S.....Minneapolis
Roberts, W. B.....Minneapolis
Robertson, H. E.....Rochester
†Robertson, J. B.....Minneapolis
Robertson, P. A.....Austin
Robilliard, C. M.....Faribault
Robinson, F. J.....Rochester
†Robinson, J. M.....Corning, N. Y.
Robitshek, E. C.....Minneapolis
Rochford, W. E.....Minneapolis
Rodda, F. C.....Minneapolis
Roehlke, A. B.....Elk River
‡Roemer, H. J.....Winona
Rogers, C. W.....Heron Lake
Rogers, S. F.....St. Paul
‡Rogne, W. G.....Spring Grove
Roholt, C. L.....Waverly
Rohrer, C. A.....Waterville
Rokala, H. E.....Virginia
Rolig, D. H.....Howard Lake
Rood, D. C.....Duluth
Root, G. T.....Rochester
Rose, J. T.....Lakefield
Rosen, Samuel.....Minneapolis
Rosenbladt, Louis.....St. Paul
‡Rosenfield, A. B.....Hibbing
‡Rosenholtz, B. I.....St. Paul
Rosenow, E. C.....Rochester
Rosenow, J. H.....Rochester
‡Rosenthal, F. H.....Grand Meadow
Rosenthal, Robert.....St. Paul
Rosenwald, R. M.....Minneapolis
Roskilly, G. C. P.....Minneapolis
‡Ross, A. J.....Minneapolis
‡Roth, F. D.....Lewiston
†Rothrock, J. L.....St. Paul
Rothschild, H. J.....St. Paul
Roust, H. A.....Montevideo
Rowe, O. W.....Duluth
Rowe, W. H.....Fairmont
Rowles, E. K.....Coleraine
Roy, P. C.....St. Paul
Rucker, C. W.....Rochester
Rucker, W. H.....Minneapolis
Rud, N. E.....Minneapolis
Rudell, G. L.....Minneapolis
‡Rudie, P. S.....Duluth

‡Ruggles, G. M.....Forest Lake
Ruhberg, G. N.....St. Paul
‡Rulison, E. T., Jr.....Rochester
‡Rumpf, C. W.....Faribault
Rumpf, W. H., Jr.....Dallas, Texas
†Rumpf, W. H.....Faribault
Rushton, J. G.....Rochester
Russ, F. H.....Rochester
Russ, H. H.....Blue Earth
‡Russeth, A. N.....Minneapolis
Rusten, E. M.....Minneapolis
Rutherford, W. C.....St. Paul
Rutledge, L. H.....Detroit Lakes
Ryan, B. F.....Rochester
Ryan, J. J.....St. Paul
Ryan, J. M.....St. Paul
Ryan, M. E.....St. Paul
Ryan, W. J.....Duluth
Rydburg, W. C.....Brooten
Rynearson, E. H.....Rochester

‡Sach-Rowitz, Alvan.....Moose Lake
‡Sadler, W. P., Jr.....Minneapolis
Saffert, C. A.....New Ulm
Sahr, W. G.....Hutchinson
‡St. Cyr, K. J.....Osseo
Saliterman, B. I.....Minneapolis
Salt, C. G.....Minneapolis
Salter, R. A.....Virginia
‡Samson, E. R.....Stillwater
‡Samuelson, L. G.....Mankato
Samuelson, Samuel.....Minneapolis
Sandell, S. T.....Oak Terrace
Sanderson, E. T.....Minneota
‡Sandt, K. E.....Minneapolis
Sandven, N. O.....Paynesville
Sanford, A. H.....Rochester
Sanford, J. A.....Farmington
Sarff, O. E.....Virginia
Sarnecki, M. M.....St. Paul
Satersmoen, Theodore..Pelican Rapids
Sather, Allen .....Fosston
Sather, E. R.....Alexandria
‡Sather, G. A.....Fosston
‡Sather, R. N.....McIntosh
‡Sather, R. O.....Crookston
Satterlee, H. W.....Lewiston
Satterlund, V. L.....St. Paul
Sauer, W. G.....Rochester
Savage, F. J.....St. Paul
Sawatzky, W. A.....Minneapolis
Sax, S. G.....Duluth
‡Sayre, G. P.....Rochester
‡Scales, J. R.....Rochester
Schaaf, F. H. K.....Minneapolis
Schade, F. L.....Worthington
Schaefer, J. F.....Owatonna
Schaefer, Samuel.....Winona
Schaefer, W. G.....Minneapolis
‡Schamber, W. F.....Parkers Prairie
Schatz, F. J.....St. Cloud
Scheetz, R. J.....Rochester
Scheifley, C. H.....Rochester
†Scheldrup, N. H.....Minneapolis
Scherer, C. A.....Duluth
Scherer, L. R.....Minneapolis
Schiele, B. C.....Minneapolis
Schimelpfenig, G. T.....Chaska
‡Schleinitz, F. B.....Battle Lake
Schlesselman, G. H.....Anoka
‡Schlicke, C. P.....Rochester
‡Schmidt, G. F.....Minneapolis
Schmidt, H. W.....Rochester
Schmidt, P. A.....Good Thunder
Schmidt, P. G., Jr.....Granite Falls
‡Schmidt, W. R.....Worthington
†Schmidt, A. F.....Minneapolis
‡Schmitt, G. F., Jr.....Rochester
†Schmitt, S. C.....Los Angeles, Calif.
Schmitz, A. A.....Mankato
Schmitz, E. J.....Holdingford
Schmitz, R. L.....Rochester
‡Schneider, H. H.....Kansas City, Mo.
†Schneider, J. P.....Minneapolis
Schneider, P. J.....Adams
Schneidman, N. R.....Minneapolis
Schoch, R. B. J.....St. Paul
Scholpp, O. W.....Hutchinson
Scholten, R. A.....Rochester
Schons, Edward.....St. Paul
Schottler, G. J.....Dexter
Schottler, M. E.....Minneapolis
Schroder, C. H.....Duluth
‡Schroeckenstein, H. F.....St. Paul
Schroeppel, J. E.....Winthrop
Schuldt, F. C.....St. Paul
Schultz, J. A.....Albert Lea
Schultz, P. J.....Minneapolis
Schulze, A. G.....St. Paul
‡Schulze, W. M.....Swanville
†Schussler, O. F.....Minneapolis
Schutz, E. S.....Mountain Lake
Schwartz, V. J.....Minneapolis
Schweiger, T. R.....Hibbing
Schwyzer, Arnold.....St. Paul
†Schwyzer, Gustav.....Minneapolis
‡Schwyzer, H. C.....St. Paul
Scofield, C. L.....Benson
Scott, E. E.....St. Paul
†Scott, F. H.....Minneapolis
Scott, H. G.....Minneapolis
‡Sealy, W. B.....Rochester
Seashore, Gilbert.....Minneapolis
‡Seashore, R. T.....Duluth
Seefeld, P. H.....Rochester
Seham, Max.....Minneapolis
Seifert, M. H.....Excelsior
Seifert, O. J.....New Ulm
Seitz, S. B.....Barnesville
‡Seljeskog, S. R.....Minneapolis
‡Sellers, G. K.....Dassel
Selmo, J. D.....Norwood
†Senkler, G. E.....St. Paul
Senn, E. W.....Owatonna
Serkland, J. C.....Rothsay
Sether, A. F.....Ruthton
Setzer, H. J.....St. Paul
Seybold, W. D.....Rochester
Shaleen, A. W.....Hallock
Shands, H. C.....Rochester
Shannon, S. S.....Ironton
Shannon, W. R.....St. Paul
Shaperman, Eva P.....Minneapolis
Shapiro, E. Z.....Duluth
Shapiro, M. J.....Minneapolis
Sharp, D. V.....Minneapolis
‡Sharpe, W. S.....Minneapolis
Shastid, T. H.....Duluth
Shaw, A. W.....Virginia
‡Shaw, H. A.....Lake Park
Shedlov, Abraham.....Fosston
Sheedy, C. L.....Austin
‡Shelden, J. T.....Rochester
Shelden. W. D.....Rochester
Shellman, J. L.....St. Paul
†Shephard, V. D.....Rochester
Sheppard, C. G.....Hutchinson
†Sheppard, Fred.....Burien, Wash.
†Sheppard, P. E.....Hutchinson
Sherman, C. H.....Stillwater
Sherman, C. L.....Luverne
Sherman, H. T.....Zumbrota
Sherman, R. V.....Red Wing
Sherwood, G. E.....Kimball
Shick, R. M.....Rochester
Shillington, M. A.....Glendive, Mont.
‡Shima, G. J.....Sleepy Eye
‡Shimonek, S. W.....St. Paul
Short, Jacob.....St. Paul
†Shrader, J. S.....Springfield
‡Sidell, C. M.....Rochester
Siegel, Clarence.....Battle Lake
Siegel, J. S.....Virginia
Siegmann, W. C.....Minneapolis
Silver, Henry.....Sebeka
Silver, J. D.....Minneapolis
Simison, Carl.....Barnesville
*Simison, C. W.....Hawley
Simons, B. H.....Chaska
Simons, E. J.....Swanville
Simons, J. H.....Minneapolis
‡Simons, L. T.....St. Paul
‡Simons, S. J.....Akeley
‡Simonson, D. B.....Minneapolis
Simonton, K. M.....Rochester
Simpson, E. D.....Minneapolis
Sinamark, Andrew.....Hibbing
Singer, B. J.....St. Paul
‡Sinykin, M. B.....Minneapolis
Siperstein, D. M.....Minneapolis
Sisler, C. E.....Grand Rapids
†Sivertsen, Andrew.....Excelsior
Sivertsen, Ivar.....Minneapolis
‡Sjostrom, L. E.....Storden
Skinner, H. O.....St. Paul
Skjold, A. C.....Minneapolis
Slater, S. A.....Worthington
‡Sloan, Julius.....Minneapolis
Slocumb, C. H.....Rochester
Sluder, F. S., Jr.....Rochester
Smalley, R. E.....Rochester
Smisek, E. A.....St. Paul
Smisek, F. M. E.....Minneapolis
Smith, A. E.....Minneapolis
Smith, Adam M.....Minneapolis
Smith, Archie M.....Minneapolis
Smith, B. A.....Crosby
Smith, C. M.....Duluth
Smith, F. B.....Rochester
Smith, F. D.....Rochester
‡Smith, F. H.....Rochester
Smith, F. L.....Rochester
‡Smith, G. G.....Fulda
Smith, H. L.....Rochester
Smith, H. R.....Minneapolis
‡Smith, L. A.....Balaton
Smith, L. A.....Rochester
Smith, L. G.....Montevideo
Smith, Margaret I.....Minneapoli
Smith, M. W.....Red Win
Smith, N. D.....Rochest
Smith, N. M.....Minneapoli
Smith, V. D. E.....St. Pa
Smith, W. R.....Grand Mara
‡Snell, A. M.....Rochest
Snyder, G. W.....St. Pa
‡Snyker, O. E.....El
Soderlind, R. T.....Minneapoli
Sogge, L. L.....Windo
Sohlberg, O. I.....St. Pa
Sohmer, A. E.....Mankat
Solhaug, S. B.....Minneapoli
Solsem, F. N.....Spice
Sommer, A. W.....Elmor
Sommers, Ben.....St. Pau
Sonnesyn, N. N.....Le Sueu
‡Sorem, M. B.....St. Pau
Sorum, F. T.....Jaspe
Souster, B. B.....St. Pau
Spang, A. J.....Dulut
Spang, J. S.....Dulut
‡Spano, J. P.....Minneapoli
‡Sperling, Louis.....Minneapoli
Spicer, F. W.....Dulut
Spink, W. W.....Minneapoli
‡Spittler, R. O.....New Richlan
Spráfka, J. M.....St. Pau
Sprague, R. G.....Rochest
Spratt, C. N.....Minneapoli
Spurbeck, R. G.....Cloque
Spurzem, R. J.....Anok
‡Stafford, C. E.....Baudett
Standard, W. P.....Rochest
Stanford, C. E.....Minneapoli
Stangl, P. E.....St. Clou
Stanley, C. R.....Worthingto
Stark, F. M.....Rochest
Starekow, M. D.....Thief River Fall
‡Stebbins, T. L.....Minneapoli
Steffens, L. A.....Red Win
Stein, K. E.....Lakevill
Stein, R. J.....Pier
‡Steinberg, C. L.....St. Pau
Steiner, I. W.....Winon
Stelter, L. A.....Minneapoli
‡Stemsrud, H. L.....Alexandri
Stenstrom, Annette E. T...Minneapoli
Sterner, E. G.....St. Pau
Sterner, E. R.....St. Pau
Sterner, O. W.....St. Pau
Stevens, John.....Gonvick
Stevenson, B. M.....Fulda
Stevenson, F. W.....Faribaul
Stewart, Alexander.....St. Pau
Stewart, A. B.....Owatonn
‡Stewart, D. E.....Grand Rapid
‡Stewart, N. E..Ft. Leonard Wood, Mo
Stewart, R. I.....Minneapoli
Stickney, J. M.....Rochest
Stillwell, W. C.....Mankat
Stilwell, G. G.....Rochest
Stinnette, S. E.....St. Pau
Stocking, F. F.....Hallock
Stoesser, A. V.....Minneapoli
Stolpestad, A. H.....St. Pau
Stolpestad, H. L.....St. Pau
†Stomel, Joseph...Los Angeles, Calif
Stotler, J. F.....Rochest
‡Stout, H. A.....Rochest
‡Stover, Lee.....Rochest
Strachauer, A. C.....Minneapoli
Strand, E. V.....Bayport
‡Stransky, T. W.....Owatonna
Strate, G. E.....St. Pau
Strathern, C. S.....St. Pete
Strathern, F. P.....St. Pete
Strathern, M. L.....Gilbert
‡Stratte, A. K.....Pine City
Stratte, H. C.....Windo
‡Straus, M. L.....St. Paul
‡Street, Bernard.....St. Cloud
Strobel, W. G.....Duluth
Stroebel, C. F., Jr.....Rochest
Strom, G. W.....Rochest
‡Stromgren, D. T.....Minneapoli
Strout, G. E.....Minneapoli
Stuart, A. B.....Cloquet
Stuhler, L. G.....Rochest
Stuhr, J. W.....Stillwater
Sturre, J. R.....Minneapoli
Stuurmans, S. H.....Minneapoli
Sullivan, R. M.....Minneapoli
‡Sullivan, R. R.....Minneapoli
Sundt, Mathias.....Minneapoli
Sutherland, H. N.....Ely
†Sutton, C. S.....St. Cloud
Sutton, H. R.....Hoffman
Sutton, Janet B.....Grand Rapids
‡Svien, H. J.....Rochester
Swanson, Cephas.....Minneapoli
Swanson, J. A.....St. Paul
‡Swanson, P. E.....Virginia

wanson, R. E.....Minneapolis
wanson, R. R.....Albert Lea
Swedburg, W. A.....Duluth
Swedenburg, P. A.....Swanville
Sweetser, H. B., Jr.....Minneapolis
Sweetser, H. B., Sr.....Minneapolis
weetser, T. H.....Minneapolis
weitzer, S. E.....Minneapolis
Swendseen, C. G.....Minneapolis
wendson, J. J.....St. Paul
wensen, R. G.....North Branch
Swenson, A. O.....Duluth
wenson, O. J.....Waseca
wezey, B. F.....Buffalo
Sybilrud, H. W.....Bricelyn

angen, G. M.....Minneapolis
anquist, E. J.....Alexandria
aylor, C. W.....Duluth
Taylor, E. S.....Worthington
Taylor, J. C.....Rochester
aylor, J. H.....Minneapolis
eisberg, C. B.....St. Paul
Teisberg, J. E.....Middle River
elford, V. J.....Litchfield
errell, B. J.....Wabasha
esch, G. H.....Elk River
habes, J. A.....Brainerd
habes, J. A., Jr.....Brainerd
hayer, E. A.....Truman
hielen, R. D.....St. Michael
homas, G. E.....Minneapolis
homas, G. H.....Minneapolis
homas, G. J.....Minneapolis
hompson, Albert.....St. James
hompson, Arthur.....Cokato
Thompson, C. O.....Hendricks
Thompson, F. A.....St. Paul
Thompson, G. J.....Rochester
hompson, H. B.....Fergus Falls
hompson, V. C..Marine-on-St. Croix
hompson, W. H.....Minneapolis
horeson, M. O.....South St. Paul
hornell, W. C.....Rochester
Thorson, E. O.....Luverne
hrockmorton, T. D.....Rochester
hysell, D. M.....Minneapolis
hysell, F. A.....Moorhead
hysell, V. D.....Hawley
Tibbetts, M. H.....Duluth
ierney, C. M.....Harmony
ifft, C. R.....St. Paul
ilderquist, D. L.....Duluth
Tillisch, J. H.....Rochester
Tinker, C. W.....Stewart
ingdale, A. C.....Minneapolis
ingdale, Carlyle.....Hibbing
inney, W. S., Jr.....Rochester
odd, Ramona L.....Minneapolis
ofte, Josephine B.....Minneapolis
orgerson, W. B.....Oklee
ownsend, De Wayne.....Brooten
racht, R. R.....St. Paul
raeger, C. A.....Faribault
ravis, J. S.....St. Paul
raxler, J. F.....Henderson
regilgas, H. R.....So. St. Paul
reusch, J. V.....Rochester
rimingham, H. G. L.....Rochester
rommald, Gladys....Northville, Mich.
Troost, H. B.....Mankato
Trow, J. E.....Minneapolis
rueman, H. S.....Minneapolis
rutna, T. J.....Silver Lake
Trytten, E. G.....Middle River
Tudor, R. B.....Hibbing
unstead, H. J.....Minneapolis
Tuohy, E. B.....Rochester
uohy, E. L.....Duluth
urnacliff, D. D.....Minneapolis
urner, T. R.....Rochester
weedy, G. J.....Winona
Tweedy, J. A.....Rochester
weedy, R. B.....Winona
wyman, R. A.....Rochester

'de, W. H.....Minneapolis
'hley, C. G.....Crookston
'ihlein, Alfred.....Rochester
'lrich, H. L.....Minneapolis
Underdahl, L. O.....Rochester
'ndine, C. A.....Minneapolis
Urberg, S. E.....Duluth

'aaler, Torvald.....Cannon Falls
'adheim, A. L.....Tyler
'adheim, J. L.....Rochester
Vail, J. B.....Henning
'alentine, W. H.....Tracy
'an Demark, R. E.....Rochester
Vandersluis, C. W.....Bemidji

Van Meier, Henry.....Stillwater
‡Van Valkenberg, J. D.....Floodwood
Vaughan, V. M.....Truman
‡Vaughn, L. D.....Rochester
Veirs, D. M.....St. Paul
Veirs, Ruby J. S.....St. Paul
Venables, A. E.....St. Paul
Veranth, L. A.....St. Cloud
Vercellini, C. H. E.....Duluth
Vezina, J. C.....Mapleton
Vik, A. E.....Minneapolis
Vik, Melvin.....Onamia
Vines, R. W.....Rochester
‡Virnig, M. P.....Wells
Vogel, H. A. L.....New Ulm
Vogel, J. H.....New Ulm
Von der Weyer, W. H.....St. Paul

Waas, C. W.....St. Paul
Wadd, C. T.....Janesville
Wagener, H. P.....Rochester
Wahlberg, E. W.....Sleepy Eye
Wahlquist, H. F.....Minneapolis
Wakefield, E. G.....Rochester
Walch, A. E.....Minneapolis
Waldron, C. W.....Minneapolis
Walfred, K. A.....St. Cloud
†Walker, A. E.....Duluth
Walker, A. E.....St. Paul
Walker, G. H.....Winona
Wall, C. R.....Minneapolis
Wallace, G. T.....Rochester
Wallace, M. O.....Duluth
Waller, J. D.....Wilmont
‡Walsh, F. M.....St. Paul
‡Walsh, M. N.....Rochester
‡Walsh, W. T.....Minneapolis
‡Walter, C. W.....St. Paul
Walter, G. F.....Farmington
‡Walters, Waltman.....Rochester
Wangensteen, O. H.....Minneapolis
†Wanous, E. Z.....Minneapolis
†Ward, A. W.....Minneapolis
Ward, B. H.....Rochester
Ward, P. A.....Minneapolis
Warner, J. J.....Perham
Warnock, R. W.....St. Paul
‡Warren, C. A.....St. Paul
Warren, F. S.....Washington, D. C.
‡Wasson, L. F.....Alexandria
‡Watkins, C. H.....Rochester
Watson, A. M.....Royalton
Watson, C. G.....Soudan
Watson, C. J.....Minneapolis
†Watson, J. D.....Minneapolis
Watson, P. T.....Bemidji
‡Watson, S. W.....Royalton
‡Watson, W. J.....Holdingford
Watz, C. E.....St. Paul
Waugh, J. M.....Rochester
Weaver, P. H.....Faribault
Webb, R. C.....Minneapolis
Webber, E. E.....Duluth
Webber, F. L.....St. Paul
Weber, H. M.....Rochester
‡Webster, L. J.....Battle Lake
Weir, J. F.....Rochester
‡Weis, B. A.....St. Paul
Weisberg, Maurice.....St. Paul
Weiser, G. B.....New Ulm
‡Weisman, S. A.....Minneapolis
*Welch, M. C.....St. Paul
‡Wellman, T. G.....Lake City
Wellner, T. O.....Anoka
Wells, A. H.....Duluth
Wells, G. R.....Rochester
‡Wells, W. B.....Jackson
Wenner, W. T.....St. Cloud
Wentworth, A. J.....Mankato
Wenzel, G. P.....St. Paul
Werner, O. S.....Cambridge
West, Catherine C.....Minneapolis
Westby, Magnus.....Madison
Westby, Nels.....Madison
†Westerman, A. E.....Montgomery
Westerman, F. C.....Montgomery
Wethall, A. G.....Minneapolis
Wetherby, Macnider.....Minneapolis
Weum, T. W.....Minneapolis
‡Wheeler, D. W.....Duluth
Wheeler, M. W.....St. Paul
‡Whitacre, J. C.....St. Paul
White, A. A.....Minneapolis
White, J. D.....Rochester
White, R. R., III.....Rochester
White, S. M.....Minneapolis
White, W. D.....Minneapolis
Whitesell, L. A.....Minneapolis
‡Whitehouse, F. R.....Rochester
Whitmore, F. W.....St. Paul
‡Whitney, R. A.....Cambridge
Whitson, S. A.....Albert Lea

Whittemore, D. D.....Bemidji
‡Widen, W. F.....Minneapolis
‡Wiechman, F. H.....Montgomery
Wilcox, A. E.....Minneapolis
‡Wildebush, F. F.....Minneapolis
Wilder, K. W.....Minneapolis
Wilder, R. L.....Minneapolis
Wilder, R. M.....Rochester
Wilder, R. M., Jr.....Rochester
Wilhelm, Agatha M.....Rochester
Wilken, P. A.....Minneapolis
Wilkinson, Stella L.....Newport
Wilkowske, R. J.....Owatonna
Will, C. B.....Bertha
Will, W. W.....Bertha
Williams, A. B.....St. Paul
Williams, C. A.....Pipestone
Williams, C. K.....St. Paul
‡Williams, J. A.....Hibbing
Williams, H. L., Jr.....Rochester
Williams, H. O.....Lake Crystal
Williams, J. A.....St. Paul
Williams, L. A.....Slayton
Williams, M. R.....Cannon Falls
Williams, R. V.....Rushford
Williams, Robert.....Minneapolis
‡Williamson, G. A.....St. Paul
Willius, F. A.....Rochester
Willson, D. M.....Rochester
‡Wilmot, C. A.....Litchfield
Wilmot, H. E.....Litchfield
Wilson, C. E.....Blue Earth
‡Wilson, I. H.....Worthington
‡Wilson, J. A.....St. Paul
Wilson, J. V.....St. Paul
Wilson, K. G.....Rochester
Wilson, L. B.....Rochester
Wilson, R. H.....Winona
Wilson, V. O.....Minneapolis
Wilson, W. E.....Northfield
†Wilson, W. F.....Lake City
Wiltrout, I. G.....Oslo
Winer, L. H.....Minneapolis
‡Wingquist, C. G.....Crosby
Winnick, J. B.....St. Paul
Winter, J. A.....Duluth
Winther, Nora M. C.....Minneapolis
‡Wipperman, F. F.....Minneapolis
Witham, C. A.....Minneapolis
Withrow, M. E.....International Falls
Wittich, F. W.....Minneapolis
Wohlrabe, A. A.....Minneapolis
Wohlrabe, C. F.....No. Mankato
Wohlrabe, E. J.....Springfield
Wold, K. C.....St. Paul
‡Wolfe, H. H.....St. Paul
Wolff, H. J.....St. Paul
‡Wolkoff, H. J.....St. Paul
Wollaeger, E. E.....Rochester
Wolner, O. H.....St. Peter
Wolstan, S. D.....Minneota
Woltman, H. W. F.....Rochester
Wood, H. G.....Rochester
‡Wood, W. W., Jr.....Rochester
Woodruff, C. W.....Chatfield
Woodworth, Elizabeth A...Minneapolis
*Woodworth, L. F.....Le Center
Workman, W. G.....Tracy
Wray, W. F.....Campbell
†Wright, C. D.....Minneapolis
†Wright, C. O.....Luverne
Wright, S. G.....Minneapolis
Wright, W. S.....Minneapolis
Wulf, R. F.....Rochester
Wunder, H. E.....Shakopee
Wyatt, O. S.....Minneapolis
Wynne, H. M. N.....Minneapolis
Wyrens, R. G.....Rochester

Yaeger, W. W.....Marshall
‡Yeager, C. L.....Rochester
Ylvisaker, R. S.....Minneapolis
Yoerg, O. W.....Minneapolis
Young, H. H.....Rochester
Young, T. O.....Duluth
‡Younger, L. I.....Winona
Youngren, E. R.....St. Paul

Zachman, A. H.....Melrose
Zachman, L. L.....St. Paul
Zaworski, E. A.....Minneapolis
Zeman, E. W.....Hibbing
‡Zemke, E. E.....Fairmont
Zierold, A. A.....Minneapolis
Zimmermann, H. B.....St. Paul
Zinter, F. A.....Minneapolis
Ziskin, Thomas.....Minneapolis
Zlatovski, M. L.....Duluth
Zuschlag, Ella.....Rochester

MINNESOTA STATE MEDICAL ASSOCIATION

Ninetieth Annual Session

Hotel Radisson, Minneapolis

May 17, 18, 19, 1943

Registration: The registration desk on the Mezzanine floor of the Hotel Radisson will open Sunday, May 16. Members are requested to bring their membership cards.

This year there will be two sections. Section II will be held in the Flame Room and will be devoted to scientific motion pictures, except that on Monday morning the American College of Chest Physicians will hold its Regional Meeting in this room.

Luncheons: Twenty Round Table Discussion Luncheons have been arranged for Tuesday and Wednesday, May 18 and 19. Tickets must be purchased in advance for these luncheons. Lists of subjects and leaders are printed in this program and on reservation cards mailed with the program. Attendance at each luncheon is limited to 25 and late-comers will be accommodated according to their choice if limits have not already been reached. Tickets $1.00.

Annual Banquet: The annual dinner for members, guests and their wives will be held at the Minikahda Club, Tuesday, May 18, at 7:00 P. M. The Honorable Walter H. Judd, Congressman from Minnesota, and S. H. Baxter, President of the Minnesota State Medical Association, will be banquet speakers. Tickets $2.00.

Open House: All convention visitors and their wives will be guests of the Minnesota State Medical Association and the Hennepin County Medical Society at an Open House, to be held Monday night, May 17, at 7:30 P. M., on the Mezzanine Floor at the Hotel Radisson. Exhibits will be open for leisurely inspection and there will be a program of music and motion pictures.

Guest Speakers: Three societies are sponsoring visiting speakers:

The Minnesota Radiological Society is sponsoring Dr. Edward L. Jenkinson, Director of the Department of Radiology at Saint Lukes Hospital, Chicago, who will deliver the Russell D. Carman Memorial Lecture on the subject of "The Differentiation of Endometriosis and Carcinoma of the Sigmoid Colon."

The Northern Minnesota Medical Association is sponsoring the Honorable Walter H. Judd, Congressman from the Fifth District, Washington, D. C.

The Northwestern Pediatrics Society is sponsoring Dr. Frank C. Neff, Kansas City, Kansas.

Minnesota Academy of Ophthalmology and Otolaryngology: The Academy will sponsor the Symposium on "Eye, Ear, Nose and Throat Diseases for the General Practitioner," Tuesday, May 18, at 11:00 A. M., in the Gold Room. A program of Case Reports by Minneapolis members has also been arranged by the Academy for Tuesday, May 18, 2:00 to 4:00 P. M., in the Spanish Room. Both are open to all convention visitors. The Round Table Luncheon on "Treatment of Acute Infections of the Nose and Sinuses," scheduled for Tuesday, May 18, at 12:15 P. M., is also sponsored by the Academy and is open to all visiting physicians within the attendance limit set for Round Table Luncheons.

Child Health in Wartime: A special Conference on Child Health and Welfare Problems in Wartime will conclude the program, Wednesday, May 19, 2:00 to 4:00 P. M. Nurses, nutrition workers, social welfare workers and members of Parent-Teacher Associations will be invited to attend this session.

Medal: The Southern Minnesota Medical Association will present its annual medal for the best scientific exhibit presented by an individual physician at this meeting. Presentation will be made at the Banquet, Tuesday evening, May 18, at the Minikahda Club.

Fifty Club: This year's candidates for election to Minnesota's "Fifty Club" will be honor guests of the Association at the 90th Annual Banquet to be held Tuesday, May 18, at 7:00 P. M., at the Minikahda Club. Presentation of lapel buttons and certificates to candidates will be a feature of the Banquet program.

Woman's Auxiliary: Wives of physicians attending the meeting may secure programs of business and social sessions of the Woman's Auxiliary at the Women's Registration Desk in the Lobby of the Hotel Curtis. All visiting women are cordially invited to attend the special events arranged by the hostesses of the Hennepin County Medical Society Auxiliary.

Medical Women's Luncheon: A luncheon meeting for all women physicians will be held Monday, May 17, at 12:15 P. M. Reservations for the luncheon should be made direct to Dr. Nora M. C. Winther, Vice President, Minnesota Branch, American Medical Women's Association, 1450 Medical Arts Building, Minneapolis.

University of Minnesota Alumni: University of Minnesota alumni will hold their annual reunion at a cocktail hour to be held at 5:00 P. M., Tuesday, May 18, at the Minikahda Club before the Annual Banquet. All University alumni are invited to attend.

Golf: The annual Golf Tournament of the Minnesota State Medical Association will be held Sunday, May 16, at 1:00 P. M., at the Minikahda Club, Minneapolis. Attractive prizes have been donated. All medical golfers are urged to enter. Registrations should be made in advance on the enclosed card to L. R. Boies, Minneapolis.

SCIENTIFIC PROGRAM
HOTEL RADISSON

Monday, May 17, 1943

SECTION I—GOLD ROOM

A. M.

9:00 **Fracture Symposium**
Compression Fractures of the Spine—C. C. Bell, Saint Paul
Intertrochanteric Fractures of the Hip—M. O. Henry, Minneapolis
Ununited Fractures—M. S. Henderson, Rochester
Injuries of the Urinary Tract Complicating Fractures of the Pelvis—T. H. Sweetser, Minneapolis

11:00 **Fracture Symposium (Continued)**
Fractures and Dislocations of the Carpal Bones—E. R. Anderson, Minneapolis
Fractures of the Lower End of the Radius and Ulna—C. C. Chatterton, Saint Paul
Discussion

P. M.

2:00 **Care of the Aged**
General Management—J. F. Norman, Crookston
Nutritional Needs—E. L. Tuohy, Duluth
Surgery—O. T. Clagett, Rochester
Discussion

4:00 **Russell D. Carman Memorial Lecture**
The Differentiation of Endometriosis and Carcinoma of the Sigmoid Colon
Edward L. Jenkinson.....Chicago, Illinois
Associate Professor of Radiology, Northwestern University, and Director of the Department of Radiology, St. Lukes Hospital, Chicago

SECTION II—FLAME ROOM

A. M.

9:00 **American College of Chest Physicians, Regional Meeting**
Bronchiectasis—H. C. Hinshaw, Rochester
Bronchial Tuberculosis—R. J. Davies, Nopeming
Experiences in a Program for the Control of Pulmonary Tuberculosis in Chicago—Richard Davison, Chicago, Illinois
Secretary to the Board of Directors, Chicago Municipal Tuberculosis Sanitarium

11:00 **American College of Chest Physicians, (Continued)**
Silicosis
A. E. Russell.....New York, City
Senior Surgeon, United States Public Health Service, Liaison Officer, Second Service Command, Governor's Island
Discussion

P. M.

SCIENTIFIC CINEMA

2:00 **Inguinal Hernioplasty**
Medical Film Guild

2:30 **Tendon Injuries**
R. K. Ghormley.....Rochester

4:00 **Postpartum Hemorrhage**
J. B. De Lee.....Chicago
(This film was completed just before the author's death in April, 1942)

Tuesday, May 18, 1943

SECTION I—GOLD ROOM

A. M.

9:00 **Abnormal Uterine Bleeding**
In Adolescence—Nora M. C. Winther, University of Minnesota
In Pregnancy—F. J. Schatz, St. Cloud
In the Menopause—L. M. Randall, Rochester

11:00 **Eye, Ear, Nose and Throat Diseases for the General Practitioner**
Diagnosis of Glaucoma—A. G. Athens, Duluth
Industrial or "Shipbuilders'" Kerato-Conjunctivitis—K. C. Wold, St. Paul
Foreign Bodies in Food or Air Passages—K. A. Phelps, Minneapolis
Discussion

12:15 **Round Table Luncheons**

P. M.

2:00 **Cardiovascular Disease**
Coronary Disease—A. R. Barnes, Rochester
Hypertensive Heart Disease—G. E. Fahr, Minneapolis
Psychosomatic Aspects of Hypertension—W. H. Hengstler, St. Paul
Medical Management of Early Cases of Hypertension—S. G. Sax, Duluth

4:00 **Practical Applications of a Routine Blood Count in the Newborn with Special Reference to the Obstetrical Nursery**
Frank C. Neff.....Kansas City, Kansas
Professor of Pediatrics and Head of Department, School of Medicine and Children's Hospital, University of Kansas

SECTION II—FLAME ROOM

A. M.

SCIENTIFIC CINEMA

9:00 **Myasthenia Gravis**
L. M. Eaton.....Rochester
O. T. Clagett.....Rochester

9:45 **Fascia Lata in Repair of Hernia**
J. M. Hayes.....Minneapolis

11:00 **Peptic Ulcer**
E. D. Kiefer.....Boston

12:15 **Round Table Luncheons**

P. M.

SCIENTIFIC CINEMA

2:00 **A Clinic on Sigmoid Sinus Thrombosis**
Medical Film Guild

2:40 **Vaginal Hysterectomy**
J. M. Waugh.....Rochester

4:00 **Pharmacology of Respiratory Stimulants**
Medical Film Guild

7:00 **Annual Banquet.....Minikahda Club**

Wednesday, May 19, 1943

SECTION I—GOLD ROOM

A. M.

9:00 **Newer Therapeutics in Surgery**
Use of Sulfonamides in Abdominal Surgery—C. E. Rea, Saint Paul
Use of Dicumarol—N. W. Barker, Rochester
Use of Blood and Blood Substitutes—
J. E. Blumgren.....Duluth
M. G. Gillespie.....Duluth
Discussion

11:00 **Control of Tropical Diseases**
Captain E. G. Hakansson (MC)..U. S. Navy

12:15 **Round Table Luncheons**

P. M.

2:00 **Child Health in Wartime**
Feeding the Child—R. E. Nutting, Duluth
Preparing the Child for School—Jeannette Baker, Fergus Falls
Emotional Problems of Children—H. F. Helmholz, Rochester
Caring for Children of Working Mothers—J. A. Anderson, Minneapolis
Juvenile Delinquency—H. B. Hanson, University of Minnesota

SECTION II—FLAME ROOM

SCIENTIFIC CINEMA

A. M.

9:00 **Nonoperative Treatment of Paranasal Sinusitis**
Medical Film Guild

9:30 **Otitis Media in Pediatrics**
Medical Film Guild

11:00 **Skin Grafting**
A Demonstration of Technique Especially Adaptable to the Resurfacing of Granulating Areas by Use of the Padgett Dermatone—H. O. McPheeters, Minneapolis

12:15 **Round-table Luncheons**

P. M.

2:00 **Child Health in Wartime**

(See Program in Section I)

Protection of the health and well-being of children is the most urgent of all wartime civilian health problems. For that reason, the program for Wednesday afternoon, May 19, will be devoted entirely to the subject, "Child Health in Wartime." Public health nurses, social welfare workers, members of Parent-Teacher Associations and all others especially interested in child health are invited to attend this session with the physicians.

SCIENTIFIC EXHIBITS

S-9 **American Medical Association**
Tularemia—Spread and Control
Tularemia—Pathology

S-3 **Committee on First Aid and Red Cross**
J. S. Lundy, Chairman, Rochester

S-1 **Mayo Clinic and Mayo Foundation**

S-4 **Minnesota Public Health Association**
E. A. Meyerding, Executive Secretary, Saint Paul

S-10 **Minnesota Society for the Control of Cancer**
Mrs. S. E. Linsley, Executive Secretary, Saint Paul

S-2 **Minnesota Society for the Prevention of Blindness**
F. E. Burch, Secretary, Saint Paul

S-7 **Minnesota State Department of Health**
A. J. Chesley, Secretary and Executive Officer, Saint Paul

S-8 **The Surgical Aspect of Strabismus**
W. H. Fink, Minneapolis

S-6 **Tuberculosis Control in Minnesota**
Committee on Tuberculosis
J. A. Myers, Chairman, Minneapolis

S-11 **University of Minnesota**
Department of Ophthalmology
University of Minnesota
University Press

S-5 **War Injuries of the Face and Jaws and Fractures of the Facial Bones**
C. W. Waldron, Minneapolis

Exhibits and Demonstrations will be open daily at 8:00 A. M., during the intermissions and preceding the afternoon sessions.

Round-table luncheon discussions will be held Tuesday and Wednesday. Reservations should be made in advance.

WOMAN'S AUXILIARY

Mrs. Raymond J. Josewski, *President*
Stillwater, Minnesota
Mrs. W. H. Rucker, *Publicity Chairman*
Minneapolis, Minnesota

ANNUAL CONVENTION
May 17-18-19, 1943
Headquarters—Radisson Hotel, Minneapolis, Minn.

Monday, May 17

8:00 a.m.—Registration—Radisson Hotel
10:00 a.m.—Executive Board Meeting followed by Luncheon at 1:00 p.m.—Curtis Hotel (Board members only)
3:30 p.m.—Tea—Medical Arts Building—20th Floor All visiting women are invited as guests of Hennepin County Medical Auxiliary

Tuesday, May 18

8:00 a.m.—Registration—Radisson Hotel
10:00 a.m.—Annual Meeting—followed by Luncheon at 1:00 p.m.—Curtis Hotel—Open to all members. Musical program following
Post-convention board meeting immediately following luncheon program

Wednesday, May 19

10:00 a.m.—12 noon
Final get-together—all members invited
Medical Arts Lounge—20th Floor
Guests of Hennepin County Medical Auxiliary.

Committee chairmen for the annual meeting are:
General Arrangements—Mrs. Joseph M. Hall; co-chairman, Mrs. Frederick H. K. Schaaf.
Registration—Mrs. Walter K. Haven
Hospitality—Mrs. William B. Roberts; co-chairman Mrs. James M. Hayes
Publicity—Mrs. William R. Jones; co-chairman, Mrs. William H. Rucker
Flowers—Mrs. John F. Curtin
Music—Mrs. Harold F. Wahlquist
Tickets—Mrs. David D. Anderson
Tea Arrangements—Mrs. Samuel B. Solhaug
Annual Luncheon—Mrs. Edward A. Regnier

Hennepin County Medical Auxiliary extends a hearty welcome to auxiliary members throughout the state

Ramsey County

Presidents and secretaries of all Saint Paul women's clubs were invited to the Public Relations Tea given by Ramsey County Medical Auxiliary, March 29, in the club rooms of the Medical Arts Building in Saint Paul.

Mrs. Arnold Gruenhagen, an auxiliary member, who is chairman of the speakers' bureau of the Ramsey County Red Cross, explained the work of her group.

Mrs. W. H. Von der Weyer and Mrs. E. C. Eshelby of the Civilian Defense Council told of Ramsey's participation in that branch of war work.

The entertainment of the afternoon was a charming book review by Mrs. Joy Jones entitled "Old Soldiers Never Die." A simple yet lovely tea completed an afternoon that Ramsey visitors will long remember.

Washington County

A twenty-five-dollar cash prize has been awarded Washington County Medical Auxiliary in the National Hygeia Contest. Mrs. D. Kalinoff, Stillwater, was the Washington County chairman. Heartiest congratulations for such splendid endeavor.

Minnesota Academy of Medicine

Meeting of February 10, 1943

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, February 10, 1943. Dinner was served at 7 o'clock and the meeting was called to order at 8:10 p.m. by the President, Dr. H. B. Zimmermann.

There were thirty-six members and one guest present.

Minutes of the January meeting were read and approved.

There being no old or new business to come before the Academy, the scientific program followed immediately.

TRANSIENT INFILTRATION OF THE LUNG PARENCHYMA ASSOCIATED WITH EOSINOPHILIA

EVERETT K. GEER, M.D.
Saint Paul, Minnesota

Dr. Everett K. Geer, of Saint Paul, presented a case report on the above subject. It was of interest because it simulated tuberculosis as the involvement was in the upper lobes. The clinical course in the hospital was afebrile and complete recovery occurred without any specific therapy for her allergic conditions.

(This and another similar case will be published in MINNESOTA MEDICINE at a later date.)

Discussion

DR. ERLING W. HANSEN (Minneapolis): I have been very much interested in this matter of allergy, and I think Dr. Condit is very much in order when he brings that into the picture. We have been too prone, in the past, to think that eosinophilia occurred only with such conditions as trichinosis. In our department of Eye, Ear, Nose and Throat, there is no question but what eosinophilia is of importance in several conditions. Not having looked up the subject beforehand, but remembering very distinctly swellings such as occur in the vasomotor reactions in allergic nasal difficulties of asthma, and the soft swellings in the lids and conunctivæ in hay fever and inhalant sensitivities and others like spring catarrhal conjunctivitis, we know that not only in smears but also in the blood picture there is a very definite eosinophilia. In looking back some time ago into the subject of migraine as it ties up with the question of allergy, a very striking illustration of what can happen, a marked swelling with edema of the brain, is reported in the *Journal of Allergy* about 1936 by Goltman.

The patient was a nurse who had such terrific headaches that a decompression was performed. Following this, she had a marked herniation of the brain in the decompression area every time she had these headaches. And not until then was she studied from the standpoint of allergy. She was getting the reaction from wheat. If you can have that much reaction in the brain, I suppose it is possible to have just as much reaction in the nose, bronchial tree, with infiltration of the lung; and it does seem that this transient lung picture possibly fits in here.

DR. ALFRED HOFF (Saint Paul): Was there anything in this case that might suggest peri-arteritis nodosum?

DR. H. B. ZIMMERMANN (Saint Paul): I recently saw a man with what I think might have been intestinal obstruction, with cramp-like pains coming on at various times. This was always followed by a high eosinophilic count and we took it to be an allergic reaction.

DR. GEER (in closing): I want to thank the gentlemen who have discussed this report. In answer to Dr. Hoff's question—aside from the asthma and eosinophilia, the complaint which suggested peri-arteritis nodosum was the discomfort in the left leg which needed close questioning as to whether it was pain or numbness. The muscle biopsy was done with arterial changes in mind and also trichinosis.

I suspect this condition is more common than we know. Shortly after this woman left the hospital I saw in consultation another woman at Midway Hospital who had been ill about two months, with an asthmatic onset with a shifting parenchymal involvement and an eosinophilia. She, however, had prolonged fever but recovered.

It should be emphasized that this is a benign condition though the illness may be protracted. As far as I know, no deaths have occurred.

DR. ZIMMERMANN: Do you consider this an allergic condition?

DR. GEER: That is the present-day conception.

INJURY TO SPINAL CORD AND MENINGES FROM SPINAL ANESTHETIC

GORDON R. KAMMAN, M.D.
Saint Paul, Minnesota

Dr. Gordon Kamman, of Saint Paul, gave a paper on the above subject. Dr. A. B. Baker, University of Minnesota (by invitation), gave the pathological report on the case.

Abstract (Dr. Kamman)

A case is reported in which a sixty-six-year-old male was given a spinal anesthetic of metycaine to facilitate the suprapubic removal of an hypertrophied prostate. Patient never recovered sensation or motor power of lower extremities and died of a cerebral accident seven months later.

Abstract (Dr. Baker)

Pathological examinations of the spinal cord revealed an extensive chronic inflammatory membrane involving all layers of the meninges and completely obliterating both the subdural and subarachnoid spaces in the lower thoracic and upper lumbar segments of the cord. At these same levels, the cord itself showed an extensive damage to the posterior columns.

In the higher cord segments only the ascending columns of Gall were demyelinated.

Discussion

Dr. E. M. Hammes (Saint Paul): I want to congratulate Dr. Kamman on this interesting report, and also Dr. Baker on the beautiful pathological specimens. There seems to be considerable difference of opinion as to what produces the serious reactions following spinal anesthesia. Viers, referring to novocaine, states that none of the complications encountered is due to this anesthetic or the method but either to inaccuracies in the dosage or due to poor technique. Lunde suggests that many of the accidents following spinal anesthesia in man are due to factors other than the action of the anesthetic agent and that it seems probable that when paralysis follows the use of ordinary doses of spinal anesthetic, the spinal cord was previously diseased. Dr. Davis and his co-workers, on the other hand, believe that all spinal anesthetics are both hemolytic and myelitic. I have had an opportunity to study eight such cases. Five were patients who had preëxisting neurological diseases. It is a well-recognized fact that patients with preëxisting neurological diseases should not be given a spinal anesthetic. It may rarely be justifiable when the surgical condition is an acute one where the physician does not have sufficient time and opportunity to study the patient neurologically. I think it is very important that at least a superficial neurological examination be made on every patient before a spinal anesthetic is given to exclude any preëxisting neurological disease. Light and his co-workers, in the January, 1940, issue of *Surgery*, summarize over 60,000 cases and emphasize the various neurological complications.

Dr. E. K. Geer (Saint Paul): I would like to ask Dr. Kamman if this problem has been approached on the basis of idiosyncrasy or allergy? Has any one done any skin testing with the various drugs used for spinal anesthesia?

Dr. L. W. Barry (Saint Paul): Does this come from lumbar puncture also, or do we get it when administering spinal anesthetic?

Dr. Hammes: I would appreciate it if Dr. Baker would advise us what the condition of the blood vessels was in the pia arachnoid.

Dr. F. F. Callahan (Pokegama): Could this be the result of infection?

Dr. R. T. La Vake (Minneapolis): It seems to me that the directional tendency of this interesting and important paper must be met with balance. First, may I ask Dr. Kamman if he feels that we should not use spinal anesthesia? He did not say so, and likely feels as I do that there is relative danger in the use of any anesthetic and the best we can do is to decide which anesthetic is the least dangerous under conditions present.

We have tested practically every type of anesthesia on our service at the Minneapolis General Hospital. We have had lethal ether inhalation pneumonias, but, as chance would have it, have never had difficulty with spinal anesthesia. The few tragic consequences of spinal anesthesia that I have seen in various clinics have made me avoid spinal anesthesia unless in consultation the majority believed it to be the least dangerous in that particular case.

Dr. J. A. Lepak (Saint Paul): I would like to ask Dr. Kamman whether in these cases there was good anesthesia—did the patient take it well and was the surgeon satisfied with the anesthesia?

Dr. H. B. Zimmermann (Saint Paul): In answer to Dr. La Vake's question, I think the usual anesthetic hazards—embolism, thrombosis, pulmonary complications—are just as likely to happen (because of the lowering of blood pressure) after spinal anesthesia as after inhalation anesthesia.

Dr. Kamman (in closing): So far as I can find out I don't think that technique has anything to do with it. Some men, in reviewing possible causes, say technique has something to do with it. There have been many cases reported where the technique was faultless as possible, and poor results obtained. There was no inflammatory reaction in the spinal cord or meninges in this particular case. A degenerative process takes place which, to my way of thinking, is irreversible in some cases.

Answering Dr. Geer, I think there is an idiosyncrasy; so far as I know, no patch tests have been made.

Answering Dr. Barry, lumbar puncture itself has never caused changes of this kind.

Answering Dr. Callahan, this is not an infectious process.

Answering Dr. La Vake, it is a question of balance. There is risk in all anesthetics. I think we do have to remember that there are thousands of cases in which spinal anesthetic is used without any trouble.

Answering Dr. Lepak's question—was anesthesia satisfactory? not in the last case; they had to give him cyclopropane in order to remove the appendix.

Answering Dr. Condit, I don't think hypertension has anything to do with it.

Dr. A. B. Baker (University of Minnesota) (by invitation): In this case there were no vascular changes. Some of the vessels were constricted by the membrane but none of the vessels was completely occluded. Dr. Bieter, at the University, used spinal anesthetic in rabbits; he collected the spinal cords for a study. About six months ago these cords came to my attention. We found whenever a rabbit got satisfactory spinal anesthesia every cord showed tissue damage. We can't always judge actual anatomic damage by clinical observations alone since in rabbits one may get damage to the spinal cord tissue and yet the animals seem normal in every respect.

Dr. La Vake: I would like to ask Dr. Baker if in his experiments the cords were compared with a large series of cords from apparently normal animals? When this is done in experiments with drugs affecting the liver, one often finds pathology in apparently normal animals that makes it very difficult at times to interpret similar findings, as regards cause and effect after the use of experimental drugs.

Dr. Baker: In all our experimental work we have control animals which are maintained along with the experimental rabbits. We never have found this change in the normal cords.

Dr. F. E. B. Foley (Saint Paul): The first case reported by Dr. Kamman was the case of a man under my care for prostatic obstruction. Actually two injections of the spinal anesthetic solution were given at the time of the suprapubic prostatectomy. One hundred forty mgms. of metycaine in 3.2 c.c. of fluid were first given. This did not give anesthesia sufficiently high for the operation. In twenty minutes or half an hour, a second injection of 100 mgms. of metycaine in 2.25 c.c. of fluid was given. This gave satisfactory anesthesia.

Dr. Kamman has described the permanent motor and sensory loss which ensued. In another case I gave a metycaine spinal anesthetic using 120 mgms. of the drug in even greater dilution. The same injury, in less pronounced degree, resulted. I have seen other less

significant sensory and motor changes with apparent full and complete recovery.

The experience at the Miller Hospital, where we have had three cases of severe and permanent injury among several thousand anesthesias, convinces me that the particular drug used is an important and determining factor. In all three of these cases metycaine was used. So far as I know, there has not been in the Miller Hospital a case of ill-effect from any of the other spinal anesthetics.

The Miller Hospital experience—plus the 66,000 spinal anesthesias with exceedingly small incidence of permanent ill effects mentioned by Dr. Kamman—is pretty convincing evidence that the drug used and individual idiosyncrasy are the determining factors. As an explanation for the ill effects, I take no stock at all in faults of technique as suggested by some specialists in anesthesia. All of our spinal anesthesias are done in a routine way. After so many of them, there is confidence it is a competent way. The particular drug used plus individual idiosyncrasy are more reasonable explanations than faults of technique.

For several years I have used 2 per cent metycaine solution for local urethral anesthesia in the male. For several years this went on day in and day out without the occurrence of any untoward effect whatever. Then, one day about six months ago a very severe reaction with near fatality occurred. I am confident that nothing but individual idiosyncrasy can explain that occurrence.

The meeting adjourned.

E. V. KENEFICK
Secretary

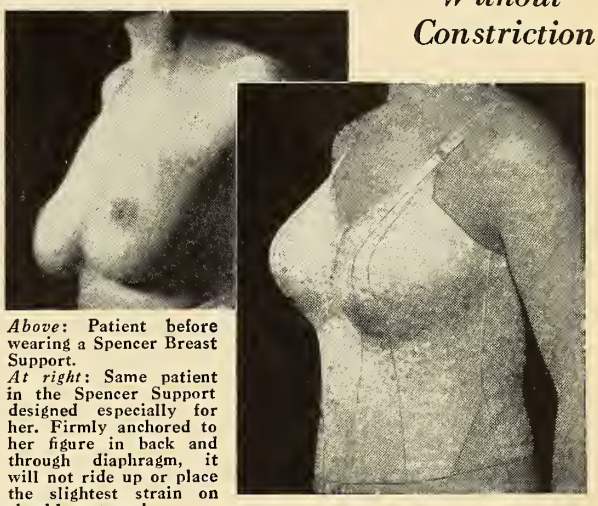
QUININE NEEDED TO TREAT MALARIA

A plea for physicians of the United States to turn in to the National Quinine Pool all supplies of quinine is contained in *The Journal of the American Medical Association* for March 13. *The Journal* says:

"Every physician is urged to contribute to the National Quinine Pool all supplies of quinine and other cinchona salts and alkaloids not absolutely essential in his practice for the treatment of malaria. These compounds are needed to maintain an adequate stockpile of antimalarial agents for use in the armed forces. Although synthetic substances such as atabrine are being produced in enormous quantities and are used wherever possible, there are many conditions for which the drug of choice is quinine. Until the war is over little cinchona bark of good quality will be forthcoming. The currently available barks from South America are of a low grade and sufficient only for the manufacture of totaquine, which is satisfactory for domestic use. The provisions of conservation orders M-131 and M-131A essentially restrict the sale, transfer, delivery or use of quinine salts and alkaloids to the treatment of malaria. Quinidine is an exception which may be used in the treatment of certain heart conditions. Such restrictions will permit physicians to contribute unused and opened quinine supplies to the National Quinine Pool, care of the American Pharmaceutical Association, 2215 Constitution Avenue, Washington, D. C. Each package received will be tested for identity, pooled and assayed. The less common salts will be processed to quinine sulfate or hydrochloride. The materials needed are bulk cinchona salts and alkaloids, tablets, capsules and pills; quinine, quinidine, cinchonine and cinchonidine. Do not send preparations of quinine or other cinchona derivatives in combination with other medicinal agents; ampules and parenteral medication; liquid preparations or quinine and urea hydrochloride, quinine and urethane, quinine bismuth iodide, elixir iron, quinine and strychnine and similar preparations. The armed forces need all available quinine. Any contribution, no matter how small, will be useful; the need is urgent."

DEFINITE UPLIFT FOR THE HEAVIEST PTOSED BREASTS!

This Spencer Support Holds Breasts in Natural Position Without Constriction



Above: Patient before wearing a Spencer Breast Support.
At right: Same patient in the Spencer Support designed especially for her. Firmly anchored to her figure in back and through diaphragm, it will not ride up or place the slightest strain on shoulder straps!

IMPROVES CIRCULATION of the blood through the breasts, lessening the chance of the formation of non-malignant nodules, and improving tone.

PROVIDES COMFORT AND AIDS BREATHING when worn by women who have large ptosed breasts.

AIDS MATERNITY PATIENTS by protecting inner tissues and helping prevent outer skin from stretching and breaking.

HELPS NURSING MOTHERS by guarding against caking and abscessing.

Individually designed for each patient.

Spencer Supports are never sold in stores. For a Spencer Specialist, look in telephone book under "Spencer Corsetiere" or write us direct.

SPENCER *INDIVIDUALLY DESIGNED*

Abdominal, Back and Breast Supports

SPENCER INCORPORATED,
137 Derby Ave., New Haven, Conn.
In Canada: Rock Island, Quebec.
In England: Spencer (Banbury) Ltd., Banbury, Oxon.

May We Send You Booklet?

Please send me booklet, "How Spencer Supports Aid the Doctor's Treatment."

.....M. D.

Address O-5

KARO Red Label and Blue Label are equally effective in MILK MODIFICATION

The chemical compositions and caloric values of these two types of KARO are practically identical.

Therefore the slight difference in flavor (hardly noticeable in the milk mixture) in no way affects the value of KARO as a milk modifier.

Either type may be prescribed for prematures, newborns and infants.



How much KARO for Infant Formulas?

The amount of KARO prescribed is 6 to 8% of the total quantity of milk used in the formula—one ounce of KARO in the newborn's formula is gradually increased to two ounces at six months.

CORN PRODUCTS REFINING CO.
17 Battery Place • New York, N. Y.

REPORTS and ANNOUNCEMENTS

COURSE IN ELECTROCARDIOGRAPHY

The Michael Reese Hospital in Chicago offers a tw weeks' full-time, intensive course in electrocardiograph from August 16 to August 25, 1943, under the direc tion of Dr. Louis N. Katz. Instruction will be give on the construction and use of the electrocardiograp machine, its operation and the interpretation of th cardiogram itself. The fee for the course is $100.0(For further information address Michael Reese Hos pital, Cardiovascular Department, 29th and Ellis Ave nue, Chicago, Illinois.

CONTINUATION STUDY COURSES

The courses offered during May and June in medi cine, hospital service and public health at the Cente for Continuation Study, University of Minnesota, in clude the following:

May 14-16—Radiology
May 17-19—Homes for the Aged
May 17-22—Kenny Technique
May 20-22—Obstetrics (Nurses)
June 1-3—Tuberculosis (Nurses)
June 1-5—Kenny Technique
June 7-12—Obstetrics and Pediatrics
Arranged—Dermatology and Syphilology

Courses completed in April and the first week of Ma included: Cancer Education, Kenny Technique, Com municable Diseases (Nurses), Electrocardiography, Ob stetrics, and Refraction.

Application blanks for registering in these course will be sent upon request from the enter for Continua tion Study, University Campus, Minneapolis, Minnesota

JOURNAL-LANCET LECTURE

The Third Annual Journal-Lancet Lecture in th Medical School of the University of Minnesota will b delivered by Professor Ernst Gellhorn, M.D., of th Medical School of the University of Illinois. The lec ture will be delivered at 8 p.m., Wednesday, May 19 1943, in the Amphitheater, Room 15, of the Medica Sciences Building of the University. Professor Gell horn's subject will be "Experimental Studies on Con ditioned Reactions and Their Implications for Medi cal Problems."

Professor Gellhorn has made particularly importan contributions to the study of specific physiologica disorders in patients with nervous and mental diseases He has been a pioneer in the endeavor to bring psy chiatric problems into the scope of study by physiologi cal methods.

Of General Interest

Dr. Emmett R. Samson of Stillwater has joined the Navy as Lieutenant Commander and has been stationed at San Diego, California, since April 5.

* * *

Dr. William W. Moir of Minneapolis paid a brief visit to Stillwater the early part of April. He still carries some of the shrapnel acquired during his visit in North Africa.

* * *

Dr. John S. Lundy of Rochester gave the Ether Day address in honor of Crawford W. Long at the University of Georgia on March 30. His paper was entitled "One Hundred One Years of Anesthesia."

* * *

Dr. H. E. Bowers of Lake City is in Vancouver, Washington, visiting his son, First Lieutenant Robert Bowers, who is with the Army Medical Corps at Barnes Hospital. During Dr. Bowers' absence Dr. W. J. Cochrane, who returned from Beverley Hills, California, in April, will be in charge of Dr. Bowers' practice.

* * *

The National Foundation for Infantile Paralysis has made a five-year grant totaling $150,000 to the Yale University School of Medicine for the establishment of a Yale Poliomyelitis Study Unit. A Yale Poliomyelitis Commission was established in 1931 by Drs. James D. Trask (now deceased) and John R. Paul. This grant will place the work of this commission on a more permanent basis.

* * *

At a special business meeting of the Wabasha County Medical Society held at Buena Vista Sanatorium, Wabasha, Minnesota, April 14, Dr. Louis A. Buie of Rochester, Councilor for the First District, an invited guest, gave a talk on various pertinent activities of the Minnesota State Medical Association. Also he showed several reels of the colored motion pictures which he has taken through the proctoscope. In these pictures he demonstrated various lesions of the colon.

Lt. Leonard J. Monson of Canby, a member of the Naval Reserve, entered active service in October. Accompanied by his family he motored to San Diego and in January left for duty with the Pacific fleet. He may be reached by a letter addressed to L. J. Monson, Lt. (MC), USNR, Headquarters Squadron, Sec-

Greetings to Minnesota Physicians!

May we welcome you to Minneapolis and extend the wish that your 1943 Convention will be the greatest on record.

CASWELL-ROSS AGENCY

Commercial Casualty Insurance Company

NORTHWESTERN BANK BLDG. MINNEAPOLIS

Health and Accident Insurers to

ST. PAUL DISTRICT DENTAL SOCIETY
MINNEAPOLIS DISTRICT DENTAL SOCIETY
ST. CLOUD DENTAL SOCIETY
WEST CENTRAL DISTRICT DENTAL SOCIETY
RAMSEY COUNTY MEDICAL SOCIETY
HENNEPIN COUNTY MEDICAL SOCIETY
ST. LOUIS COUNTY MEDICAL SOCIETY
DULUTH DISTRICT DENTAL SOCIETY
STEARNS-BENTON COUNTY MEDICAL SOCIETY



HER YEARS of usefulness extended . . . days, weeks and months restored to her that might have passed clouded with pain or distracting mental symptoms—her energies spent in the menopausal disturbances. Indeed a timely conservation of human powers!—accomplished through the judicious use of estrogenic substances....

The man who administers the treatment may reach with confidence for the estrogenic preparation of the Smith-Dorsey Laboratories—capably staffed as they are... equipped to the most modern specifications... geared to the production of a strictly standardized medicinal.

You will approve the quality of this Council-accepted Solution of Estrogenic Substances, Smith-Dorsey.

Supplied in the following dosage forms:

1 cc. Amp. 2,000 units per cc.
1 cc. Amp. 5,000 units per cc.
1 cc. Amp. 10,000 units per cc.
10 cc. Amp. Vials 5,000 units per cc.
10 cc. Amp. Vials 10,000 units per cc.
10 cc. Amp. Vials 20,000 units per cc.



The SMITH-DORSEY COMPANY LINCOLN NEBRASKA

Manufacturers of Pharmaceuticals to the Medical Profession since 1908

ond Marine Aircraft Wing, FMF, c/o Fleet Postmaster, San Francisco, California. His family has returned to Canby.

* * *

Mrs. Anne Wesbrook, widow of Dr. Frank Wesbrook, now living at 2835 West 42nd Avenue, Vancouver, B. C., writes as follows concerning the article written about her husband by Dr. Edward L. Tuohy of Duluth, which appeared in the January, 1943, number of MINNESOTA MEDICINE:

"I have waited twenty-five years to read what I thought was an adequate appreciation of my good man—and at long last I have read it. It satisfies me completely, so to you goes my very grateful thanks. To me it is a very beautiful thing that even with the lapse of years his friends still can feel the thrill as they did when he was with them."

Mrs. Wesbrook's daughter, Helen, and her two children are with Mrs. Wesbrook while Helen's husband, George Robertson, is serving in England with the British Artillery. Mr. Robertson is in charge of an anti-aircraft unit.

* * *

MEDICAL AND SURGICAL RELIEF COMMITTEE

Formed in August, 1940, this committee is putting on a nation-wide campaign to collect surgical and medical supplies for needs in Greece, Free French forces in Equatorial Africa, Royal Norwegians in Iceland, China, Russia and in America. At present primary consideration is being given the U. S. Coast Guard, the Amphibious Forces of the U. S. Atlantic Fleet, the U. S. Maritime Commission and first aid posts, needy hospitals and other recognized relief agencies in the United States and Alaska. One of the outstanding projects is the supply of medical field sets to the medical directors of civilian defense regions. Each set consists of two portable cases equipped with instruments and supplies which are being placed in hospitals and first aid posts for use by doctors and nurses.

Fishing tackle is especially desired for the equipment of kits for use by those who possibly may be stranded at sea when the ability to catch fish may be life saving.

The Committee earnestly requests donations of medical and surgical instruments, drugs, in the form of samples or otherwise, and cash. Cash contributions may be designated for special use. Physicians, pharmaceutical houses, hospitals, and drugstores are contributing.

A sub-committee for Minnesota is headed by Dr. Claude C. Kennedy, 807 Physicians and Surgeons Building, Minneapolis. Other members are Dr. Gilbert Thomas, Dr. Alice Fuller, Dr. E. C. Robitshek, Dr. Owen Wangensteen of Minneapolis; Dr. Walter R. Ramsey, Dr. Walter Brodie, Dr. Robert Rosenthal and Dr. W. R. McCarthy of Saint Paul; Dr. H. C. Johnson of Mankato; Dr. Donald C. Balfour, Dr. Wm. R. McCarty and Dr. Henry W. Meyerding of Rochester; Dr. J. F. Norman of Crookston; and Dr. Edward Bratrud of Thief River Falls. Committee members will welcome contributions.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

FLYING MEN AND MEDICINE. The Effects of Flying Upon the Human Body. E. Osmun Barr, M.D. 254 pages. Illus. Price, $2.50 cloth. New York: Funk & Wagnalls Co., 1943.

PRIMER OF ALLERGY. Warren T. Vaughan, M.S., M.D. 176 pages. Illus. $1.75, cloth. St. Louis: C. V. Mosby Co., 1943.

THE HEART IN PREGNANCY AND THE CHILD-BEARING AGE. Burton E. Hamilton, M.D., F.A.C.P., Cardiologist, Boston Lying-In Hospital, Boston, Massachusetts, and K. Jefferson Thomson, M.D., Associate Physician, Metropolitan Life Insurance Company Sanatorium, Mount McGregor, New York. 410 pages, 22 figures. Price $5.00. Boston: Little Brown and Company, 1941.

This excellent book is divided into three parts. The first portion deals with the practical aspects of the care of cardiacs throughout pregnancy, labor, delivery, and puerperium. It represents the experience and opinions of the author and his associates. The next part deals with the physiology of the effect of pregnancy on the circulation in normal women and cardiacs. The last section discusses separately the various heart diseases in women of the child-bearing age and the effect of pregnancy on the course of those diseases.

Dr. Frederick C. Irving, Professor of Obstetrics at Harvard Medical School and Obstetrician in Chief at Boston Lying-In Hospital, who has worked in close association with the authors, contributes a chapter on Delivery and Obstetrical After-Care of Cardiacs.

Dr. Hamilton has been chief of the Heart Clinic at Boston Lying-in Hospital for over twenty years, during which time more than a thousand deliveries have been accomplished under his supervision. He is certainly one of the highest authors on this special subject.

For obstetrician, internist, and general practitioner, or anyone who has to do with heart disease in pregnancy, this is an excellent book and represents an important contribution in this field.

LOUIS L. FREIDMAN, M.D.

CHEMOTHERAPY OF GONOCOCCIC INFECTIONS. Russell D. Herrold, B.S., M.D., Associate Professor of Surgery, University of Illinois. St. Louis: C. V. Mosby Co., 1943. Price $3.00.

In this work the author gives a complete list of the sulfa drugs and the evolution of each in chronological order, the history being quite complete in every detail.

He starts out stressing the diagnosis of an acute Neisserean infection—insisting on a complete history of exposure, a smear with double stain, and incidentally given an excellent technique for the double stain—also the two-glass urine test and other check-ups with which we are all familiar. He also gives a complete classification of complications to watch out for and the symptoms

INTRODUCTORY OFFER

"OVA-ESTRIN"

(Estrogenic Extract)

10,000 International Units per c.c.

Manufactured by

HOSPITAL LIQUIDS CO.

Per 15 c. c. vial, $4.25

1 VIAL **FREE** WITH THE PURCHASE OF 2 VIALS.

On this basis your cost is 19c per c.c.

ENDO LIVER EXTRACT

(Injectable)

For intramuscular use.

Purified Solution of Liver U.S.P.

Each c.c. represents 10 injectable units.

10 c.c. Vial—100 U.S.P. Units

Only $2.75

For a limited time—One 10 c.c. Vial **FREE** with the purchase of 3 Vials.

Accepted by the
Council on Pharmacy & Chemistry of the A. M. A.

C. F. ANDERSON CO INC.

901 Marquette Avenue **ATlantic 3229** **Minneapolis, Minn.**

Write for Prices in Quantities

PIONEER
QUIXAM



EITHER
HAND GLOVE

YOU CAN CONSERVE RUBBER

One glove, not a pair—fits either hand. Short wrist, quick easy on and off for examinations, dressings, treatments. No broken pairs, sorting or turning. You buy one instead of a pair at less than half the cost; only 3 sizes needed. Made of finest sheer latex.

BROWN & DAY, INC.
SAINT PAUL, MINNESOTA

as they appear in men, women and children. Incidentally, he devotes some time to non-specific urethritis.

The chapter on treatment is especially illuminating. He gives a description of each drug for both the beginning and continuation of treatment and indicates clearly the complicating dangers in the sulfa therapy, such as nausea, skin rash, microscopic hematuria.

All of this is clearly set forth so that any average practitioner by going over this volume with some degree of concentration would be very well qualified to treat such infections successfully in 99 per cent of his cases.

There is an interesting chapter dealing with individual problems totalling sixty-two cases. Concrete instances such as he lists are clearly helpful to men seeking experience from the literature, and we recommend this section very strongly to the general practitioner in getting this book.

Finally, there is an excellent bibliography attached at the termination of the work, so that those interested further can easily locate material for more detailed knowledge. E. Z. Shapiro, M.D.

MENTAL ILLNESS: A GUIDE FOR THE FAMILY. Edith M. Stern with the collaboration of Samuel W. Hamilton, M.D. 134 pages. Price $1.00, New York: The Commonwealth Fund, 1942.

This is a brief but pointed book of advice to those whose friends or relatives are stricken by mental illness. It covers the time from when the illness first starts, through hospitalization, to after-care of the patient. For example, there is a very fair and useful discussion of the problem of private versus state hospitalization. The book is written by a lay person with professional editing and advice, and is both readable and scientifically correct. Psychiatrists spend an inordinate amount of time talking to relatives of mental patients, and this situation could be improved by a wide circulation of a book like this: a thing which unfortunately is unlikely to occur. A. S. Nissen, M.D.

ATLAS OF OVARIAN TUMORS. Gemma Barzilai, M.D. 261 pages. Illus. spiral binding. $10.00. New York: Grune and Stratton, 1943.

Two books have appeared on this subject recently. The author of this book takes up the various tumors according to the structures from which they arise, namely those that arise from the Graafian follicle, those that can be traced back to development of the otherwise dormant male gonad, and so on. He does not take up the retention cysts, because he does not regard them as neoplastic growths; but on the other hand, he seems to have omitted a presentation of what we know as the proliferating cystadenoma.

Instead of placing a caption at the head of each new paragraph, the author designates the subject matter of the paragraph by notations in the margin. As regards the illustrations of the microscopic pictures, he presents a great many pictures of the same tissue, but under higher magnification. Many of his reproductions of this kind are in color. The subject matter is presented in a very entertaining manner, and I must say the paper of the book is of unusually good quality.

A. G. Schulze, M.D.

86c out of each $1.00 gross income used for members benefit

PHYSICIANS CASUALTY ASSOCIATION
PHYSICIANS HEALTH ASSOCIATION

Hospital, Accident, Sickness

INSURANCE

For ethical practitioners exclusively
(57,000 Policies in Force)

LIBERAL HOSPITAL EXPENSE COVERAGE	For $10.00 per year
$5,000.00 ACCIDENTAL DEATH $25.00 weekly indemnity, accident and sickness	For $32.00 per year
$10,000.00 ACCIDENTAL DEATH $50.00 weekly indemnity, accident and sickness	For $64.00 per year
$15,000.00 ACCIDENTAL DEATH $75.00 weekly indemnity, accident and sickness	For $96.00 per year

41 years under the same management
$2,418,000.00 INVESTED ASSETS
$11,350,000.00 PAID FOR CLAIMS
$200,000 deposited with State of Nebraska for protection of our members.
Disability need not be incurred in line of duty—benefits from the beginning day of disability.
Send for applications, Doctor, to
400 First National Bank Building Omaha, Nebraska

. . . . water without minerals is like food without salt

TASTE

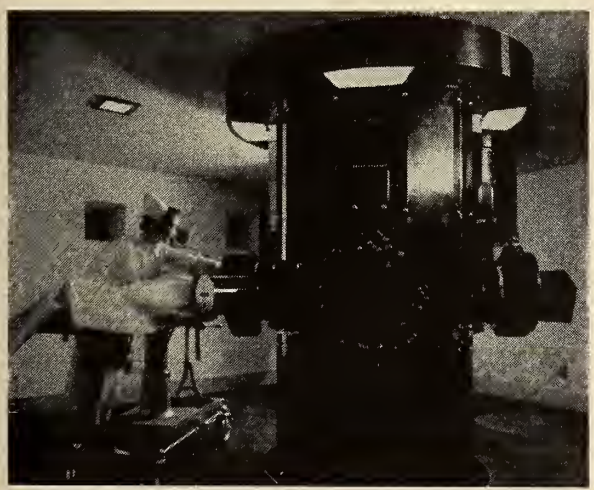
GLENWOOD
INGLEWOOD
NATURAL*
SPRING WATER
for home and office



GENEVA 4351

**Naturally Mineralized, Naturally Healthful*

Radiation Therapy Institute



Treatment Room

of Saint Paul

CHARLES T. MILLER HOSPITAL

Facilities for Radium and Roentgen Therapy, Including Million Volt Constant Potential Installation of Most Advanced Design.

You are cordially invited to visit the Radiation Therapy Institute and inspect its facilities

Edward Schons, M.D., *Director* **J. P. Medelman, M.D., *Associate Director***



The Birches Sanitarium, Inc.

2391 Woodland Avenue

Duluth, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Psychiatrists in Charge

L. R. Gowan, M.D. **A. S. Nissen, M.D.**



VOCATIONAL HOSPITAL

. . . An integral part of the Miller Vocational High School offers two special features—Patients receive a maximum of personal attention from student practical nurses—All food is prepared under the direction of a qualified dietitian. Patients remain under the care of their own physicians.

Director of Nurses—M. H. WOLTMAN, R.N., B.S.
Superintendent & Dietitian—H. B. BROWN, B.S.

Physicians may secure services of Vocational nurses by calling Nurses Headquarters and asking for a Vocational Nurse

Bridgeport 2281

5511 South Lyndale - - Minneapolis

WAUKESHA SPRINGS SANITARIUM



BUILDING ABSOLUTELY FIREPROOF

FOR THE CARE AND TREATMENT OF

NERVOUS DISEASES

BYRON M. CAPLES, M. D., Medical Director
FLOYD W. APLIN, M. D.

WAUKESHA, WIS.

DANIELSON MEDICAL ARTS PHARMACY, INC.

PHONES:
ATLANTIC 3317
ATLANTIC 3318

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

HOURS:
WEEK DAYS—8 to 7
SUN. AND HOL.—10 TO 1

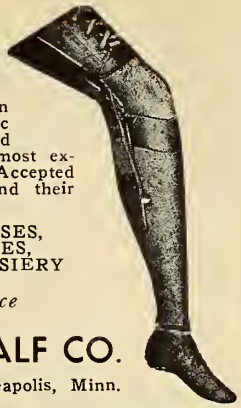
PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.

414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.

INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS

MAIN 2494

SKILL & CARE!



Combine with quality materials in all Buchstein-Medcalf orthopedic appliances. Our workmanship and scientific design conform to the most exacting professional specifications. Accepted and appreciated by physicians and their patients for more than 45 years.

ARTIFICIAL LIMBS, TRUSSES, ORTHOPEDIC APPLIANCES, SUPPORTERS, ELASTIC HOSIERY

Prompt, painstaking service

BUCHSTEIN-MEDCALF CO.

610-3rd Ave. South Minneapolis, Minn.

Complete Optical Service

LENS GRINDING
DISPENSING
CONTACT LENSES
EYE PHOTOGRAPHY

N. P. Benson Optical Co., Inc.

Established 1913

Main Office: Minneapolis, Minn.

— BRANCHES —

Aberdeen - Duluth - Eau Claire - Winona
Bismarck - La Crosse - Wausau - Stevens Point
Albert Lea - Rapid City

Cook County Graduate School of Medicine

(In Affiliation with Cook County Hospital)

Incorporated not for profit

ANNOUNCES CONTINUOUS COURSES

SURGERY—Two Weeks' Intensive Course in Surgical Technique starting May 3, 17, 31, June 14, and 28, and every two weeks throughout the year.

MEDICINE—Two Weeks' Intensive Course starting June 7. One Month's Course in Electrocardiography and Heart Disease starting the first of every month, except August. Two Weeks' Course in Electrocardiography starting August 2.

FRACTURES & TRAUMATIC SURGERY—Two Weeks' Intensive Course starting June 14 and October 18.

GYNECOLOGY—Two Weeks' Intensive Course starting June 28. One Month's Personal Course starting AUGUST 2. Clinical and Diagnostic Courses.

OBSTETRICS—Two Weeks' Intensive Course starting October 4.

OPHTHALMOLOGY—Two Weeks' Intensive Course starting September 13. Course in Refraction Methods October 4.

OTOLARYNGOLOGY—Two Weeks' Intensive Course starting September 27.

ROENTGENOLOGY—Courses in X-ray Interpretation, Fluoroscopy, Deep X-ray Therapy every wek.

UROLOGY—Two Weeks' Course and One Month's Course available every two weeks.

CYSTOSCOPY—Ten-day Practical Course every two weeks.

General, Intensive and Special Courses in All Branches of Medicine, Surgery and the Specialties.

TEACHING FACULTY — ATTENDING STAFF OF COOK COUNTY HOSPITAL

Address: Registrar, 427 S. Honore St., Chicago, Ill.



GET YOUR
U.S. WAR BONDS
AT

A GOOD TREE TO COME TO FOR SHELTER

THE MINNEAPOLIS SAVINGS AND LOAN ASSOCIATION

SAVINGS AND LOAN BUILDING
2nd AVENUE SOUTH AT 7th STREET

JOHN W. HELM . . . . . President
FRED L. ENDSLEY . Executive Sec. and Treas.

Incorporated 1891

PROFESSIONAL PROTECTION

SINCE 1899 SPECIALIZED SERVICE

In addition to our Professional Liability Policy for private practice we issue a special

MILITARY POLICY

to the profession in the Armed Forces at a

REDUCED PREMIUM

THE

MEDICAL PROTECTIVE COMPANY

OF

FORT WAYNE, INDIANA

Sterile Shaker Packages Sulfanilamide, H.W.&D.

Our total output of 5 gram Sterile Shaker Packages of Crystalline Sulfanilamide, 30–80 mesh, developed by our research staff in co-operation with military authorities for the treatment of wounds in combat zones, has previously been requisitioned for military needs (totaling more than thirty million packages).

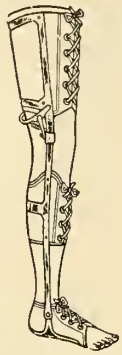
Completion of our new Sulfanilamide Division plant ahead of schedule and the resulting increased production has now made it possible for us to supply these packages for civilian medical use.

We will now accept orders for Sterile Shaker Packages of Crystalline Sulfanilamide.

The package will be available only by or on the prescription of a physician.

Complete information and prices on request.

HYNSON, WESTCOTT & DUNNING, INC.
Baltimore, Maryland



Orthopedic Braces and Appliances

Physicians' specifications followed precisely. Scientific manufacture and fitting.

AUGUST F. KROLL
Manufacturer
230 WEST KELLOGG BLVD.
St. Paul, Minn. CE. 5330

Send us your slow collection items.
All accounts made by personal calls.
We specialize in Medical and Dental Accounts.

Bonded and Licensed Under Minnesota State Laws

Northwestern Adjustment Co.
518 Bremer Arcade Bldg.
St. Paul Minnesota

✶ CLASSIFIED ADVERTISING ✶

LOCUM TENENS WANTED—Young physician available for month of June. Address D-46, care MINNESOTA MEDICINE.

* * *

WANTED—Laboratory technician, in small western Minnesota clinic. Group of three physicians. Address D-50, care MINNESOTA MEDICINE.

* * *

WANTED—Well-trained doctor, preferably with special training in some line, to assist busy general practitioner. State qualifications, give references and income and remuneration expected. Address D-49, care MINNESOTA MEDICINE.

WANTED—Medical technician, who can do either laboratory or x-ray work or both, by physician with clinic equipment. Please give full particulars as to qualifications, et cetera. Address D-48, care MINNESOTA MEDICINE.

* * *

SALESMAN WANTED by large, well-known, long established house to sell medical and hospital supplies and drugs. Large stocks and excellent inside house service. Excellent opportunity. Address D-47, care MINNESOTA MEDICINE.

Zemmer

Prescribe or Dispense ZEMMER PHARMACEUTICALS
Tablets, Lozenges, Ampoules, Capsules, Ointments, etc. Guaranteed reliable potency. Our products are laboratory controlled. Write for catalogue.
Chemists to the Medical Profession
MIN-5
THE ZEMMER CO.
Oakland Station
Pittsburgh, Pa.

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.

414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.

INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS

MAIN 2494

SAVE TIME!
TRY DAHL'S FIRST

Biologicals
Pharmaceuticals
Hypodermic Medications
Dressings
Surgical Instruments
Trusses

7:30 a.m. to 11 p.m.
Holidays, 9 a.m. to 11 p.m.

Joseph E. Dahl Co.

Incorporated

ATlantic 5445 — 82 So. 9th St., Mpls.

Radiological and Clinical

Assistance to Physicians
in this territory

MURPHY LABORATORIES

Minneapolis: 612 Wesley Temple Bldg. - - At. 4786
St. Paul: 348 Hamm Bldg. - - - - - - - Ce. 7125
If no answer, call - - - - - - - - - - Ne. 1291



Largest Orthopedic Manufacturers in the Northwest

SPECIALISTS!

Extension Shoes and Clubfoot Corrections . . . Abdominal and Arch Supports . . . Braces for Deformities . . . Elastic Stockings . . . Expert Truss Fitters . . .

•

Seelert Orthopedic Appliance Company

88 South 9th Street
Minneapolis — MAin 1768

Hall & Anderson

PRESCRIPTION PHARMACY
BIOLOGICALS
PHYSICIANS' SUPPLIES

SAINT PAUL, MINN.

LOWRY MEDICAL ARTS BUILDING
TELEPHONE: CEDAR 2735

★ V ★ V ★ ★ V ★ V ★

CHECKING SERVICE . . .

The American ECONOMY *Way*

THE AMERICAN NATIONAL BANK offers a NEW PLAN in Personal Checking Accounts.

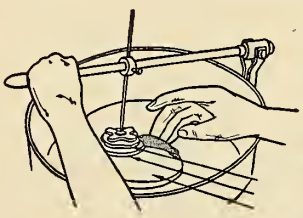
This service is offered to those who would like to open a checking account but find it inconvenient to maintain the balance required for regular checking accounts. A charge of 7c is made for each check paid, also a nominal charge on deposits.
Open an account for any amount.

THE AMERICAN NATIONAL BANK

BREMER ARCADE — *Free Parking* — *Member Federal Deposit Insurance Corporation*
7TH AT ROBERT
Cedar 0573

★ V ★ V ★ ★ V ★ V ★

UNUSUAL LENS GRINDING



CATARACT, MYO-THIN and other difficult and complicated lenses are ground to extreme thinness and accuracy by our expert workmen.

ARTHUR F. WILLIAMS

SAINT PAUL
MINNESOTA

Save 25 to 40 Per Cent

Druggists' Mutual Insurance Company
OF IOWA, ALGONA, IOWA

Fire - Tornado - Automobile Insurance

Prompt Loss Service

Minneapolis Branch—S. E. STRUBLE, 835 Palace Bldg.
Home Office—Algona, Iowa



Three of the units

Glenwood Hills Hospital

3501 Golden Valley Road
Hyland Station
Route Seven

Operated In Connection with Homewood Hospital

Plymouth at Penn Avenue, Minneapolis

FOR THE TREATMENT OF NON-SURGICAL AND NON-INFECTIOUS DISEASES

A modern hospital built on the cottage plan. The buildings are located on elevated land, affording beautiful views on all sides. Glenwood Hills Hospitals have all the advantages of rural surroundings, and are still only a few minutes by automobile from the Minneapolis loop.

AN INVITATION

The facilities of these institutions are available for all reputable members of the medical profession.

Social and Educational Adjustment

for exceptional children of all ages. Visit the school noted for its work in educational development and fitting such children for more normal living. Beautiful grounds. Home atmosphere. Separate buildings for boys and girls.

Catalog by request.

The MARY E. POGUE SCHOOL

124 GENEVA ROAD WHEATON, ILL.
(NEAR CHICAGO)



BUY WAR BONDS

AND

STAMPS



HOMEWOOD HOSPITAL is one of th Northwest's outstanding hospitals for th treatment of Nervous Disorders—equippe with all the essentials for rendering high grad service to patient and physician.

Operated in Connection with Glenwood Hills Hospitals

HOMEWOOD HOSPITAL, INC.

Corner Penn and Plymouth Avenues North
Minneapolis Minnesot

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 **June, 1943** **No. 6**

Contents

THE PHYSICIAN IN CIVIC LIFE.
Stephen H. Baxter, M.D., Minneapolis, Minnesota 521

THORACIC INJURIES.
Thomas J. Kinsella, M.D., Minneapolis, Minnesota 524

ABDOMINAL INJURIES.
M. G. Gillespie, M.D., Duluth, Minnesota..... 529

SHOCK, ITS CAUSE AND TREATMENT.
Charles E. Rea, M.D., Saint Paul, Minnesota..... 531

TREATMENT OF BURNS.
N. Logan Leven, M.D., Saint Paul, Minnesota.... 534

MANAGEMENT OF FRACTURES UNDER WAR CONDITIONS.
Harry B. Hall, M.D., Minneapolis, Minnesota.... 537

EPISIOTOMY.
James J. Swendson, M.D., Saint Paul, Minnesota. 539

CLINICAL-PATHOLOGICAL CONFERENCE.
Presentation of a Case.
A. J. Hertzog, M.D. and *S. V. Lofsness, M.D.,* Minneapolis, Minnesota 543

CASE REPORTS:
Foot Functions Following the Loss of the Tarsal Navicular.
Elmer C. Paulson, M.D., Elbow Lake, Minnesota 545
Protruded Intervertebral Disc.
Charles Koenigsberger, M.D., Mankato, Minnesota 547

HISTORY OF MEDICINE IN MINNESOTA.
History of Medicine in Dodge County. (Continued)
James Eckman, Rochester, and *Charles E. Bigelow, M.D.,* Dodge Center, Minnesota..... 548

EDITORIAL:
State Meeting in Retrospect..... 556
More Doctors Needed for Armed Forces..... 557
Danger from Fluoroscopy..... 558

MEDICAL ECONOMICS:
A Medical Congressman Reports to His Colleagues 560
Minnesota State Board of Medical Examiners... 562

WAR BULLETINS..... 564

MINNESOTA ACADEMY OF MEDICINE:
Meeting of March 10, 1943..... 566
Laryngeal Palsy.
Kenneth Phelps, M.D., Minneapolis..... 566
Chronic or Recurrent Brucellosis.
F. H. K. Schaaf, M.D., Minneapolis..... 568

REPORTS AND ANNOUNCEMENTS.....569

MINNEAPOLIS SURGICAL SOCIETY:
Meeting of October 1, 1942..... 570
Some Problems in the Pre-Operative and Post-operative Care of Patients with Hyperthyroidism.
Charles E. Rea, M.D., Saint Paul..... 570

WOMAN'S AUXILIARY..... 577

OF GENERAL INTEREST..... 579

BOOK REVIEWS..... 582

Contents of MINNESOTA MEDICINE copyrighted by Minnesota State Medical Association, 1943

Entered at the Post Office in Minneapolis as second class mail matter. Accepted for mailing at the special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 13, 1918.

MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL ASSOCIATION

Published by the Association under the direction of its Editing and Publishing Committee

EDITING AND PUBLISHING COMMITTEE

E. M. HAMMES, Saint Paul
PHILIP F. DONOHUE, Saint Paul
H. W. MEYERDING, Rochester
H. A. ROUST, Montevideo
B. O. MORK, JR., Worthington
A. H. WELLS, Duluth
O. W. ROWE, Duluth
T. A. PEPPARD, Minneapolis
HENRY L. ULRICH, Minneapolis
C. L. OPPEGAARD, Crookston

EDITORIAL STAFF

CARL B. DRAKE, Saint Paul, Editor
GEORGE EARL, Saint Paul, Associate Editor
HENRY L. ULRICH, Minneapolis, Associate Editor

BUSINESS MANAGER

J. R. BRUCE

Annual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian Subscriptions—$3.50.

The right is reserved to reject material submitted for editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

Classified advertising—five cents a word; minimum charge, $1.00. Remittance should accompany order.

Display advertising rates on request.

Address all communications to Minnesota Medicine, 2642 University Avenue, Saint Paul, or National Bldg., Minneapolis. Telephone Nestor 2641.

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN



MAIN BUILDING—ONE OF THE 5 UNITS IN "COTTAGE PLAN"

A Modern Private Sanitarium for the Diagnosis, Care and Treatment of Nervous, Mental and Medical Cases

Located on beautiful Lake St. Croix, eighteen miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational therapy under trained personnel. Milk, cream and butter from our own herd of Tuberculin-tested Registered Guernsey Cows. Inspection and coöperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

CONSULTING NEURO-PSYCHIATRISTS

Hewitt B. Hannah, M.D.
Joel C. Hultkrans, M.D.
511 Medical Arts Building
Minneapolis, Minnesota
Tel. MAin 4672

RESIDENT PHYSICIAN
Howard J. Laney, M.D.
Prescott, Wisconsin
Tel. 39

SUPERINTENDENT
Ella M. Mackie
Prescott, Wisconsin
Tel. 69

The Thought Behind the Gift...

WHAT GIFT DO THEY GO FOR?—CIGARETTES!
WHAT BRAND DO THEY LIKE BEST?—CAMEL!

WHEN you're thinking of gifts for friends or relatives in service, you can bank on this... It's cigarettes they appreciate... and Camel, the smoke they like best.*

Today, as in the past, Camels are the favored brand of millions and millions of Americans. It's the special mildness of Camels, their delightful fragrance, their ever-appealing flavor.

Camels by the carton... the way your dealer features them... is the thoughtful, generous gift. Send Camels today.

CAMEL—COSTLIER TOBACCOS



BUY WAR BONDS AND STAMPS



* With men in the Army, the Navy, the Marine Corps, and the Coast Guard, the favorite cigarette is Camel. *(Based on actual sales records in Post Exchanges and Canteens.)*



The art of anatomic illustration entered a new epoch upon the publication of the Tabulae Anatomicae of Giulio Casserio (Venice, 1627). This female figure is one of Casserio's most beautiful copperplates.



THEELIN AQUEOUS SUSPENSION

For patients requiring high potencies, and for those who do not tolerate oil injections.

THEELIN AQUEOUS SUSPENSION provides the same pure, natural crystalline estrogen as Theelin in Oil, and the same effective clinical results may be expected in the treatment of menopausal syndrome and other conditions due to diminishing estrogenic secretion. Theelin Aqueous Suspension is administered intramuscularly. Normal saline solution—no suspending agent—is used in preparing this product and the ampoule need only be shaken gently before the preparation is drawn into the syringe.

The uniform potency of Theelin is certified by the Laboratories of both Parke, Davis & Company and St. Louis University. Kapseals Theelol (Oral) and Theelin Suppositories (Vaginal) are available for maintenance therapy and for use in milder hypogonadal conditions.

•

THEELIN AQUEOUS SUSPENSION

1-cc. ampoules, each cc. containing 2 mg. (20,000 I. U.) of Theelin suspended in normal saline solution.

•

THEELIN IN OIL

1-cc. ampoules in strengths up to 1 mg. (10,000 I.U.) of Theelin per cc.

ARMY E NAVY

PARKE, DAVIS & COMPANY

DETROIT, MICHIGAN

NEW IMPROVED

DRYCO

FOR WARTIME INFANT FEEDING





For the physician... DRYCO offers FORMULA FLEXIBILITY to meet individual feeding problems, and Dryco formulas are easy to prescribe.



For the infant... DRYCO FORMULAS supply high levels of milk proteins and minerals, low levels of fat, and ample potencies of vitamins A, B complex, and D to provide for optimal growth and health.



For the mother... DRYCO is readily available at drugstores without inconvenience or delay. Formula preparation is quick and easy, for New Improved Dryco is readily soluble in warm or cold water.



For the war effort... DRYCO is a dehydrated, low-fat milk food—hence it conserves urgently needed butterfat, metal for packaging, and shipping space.

Dryco Formulas:

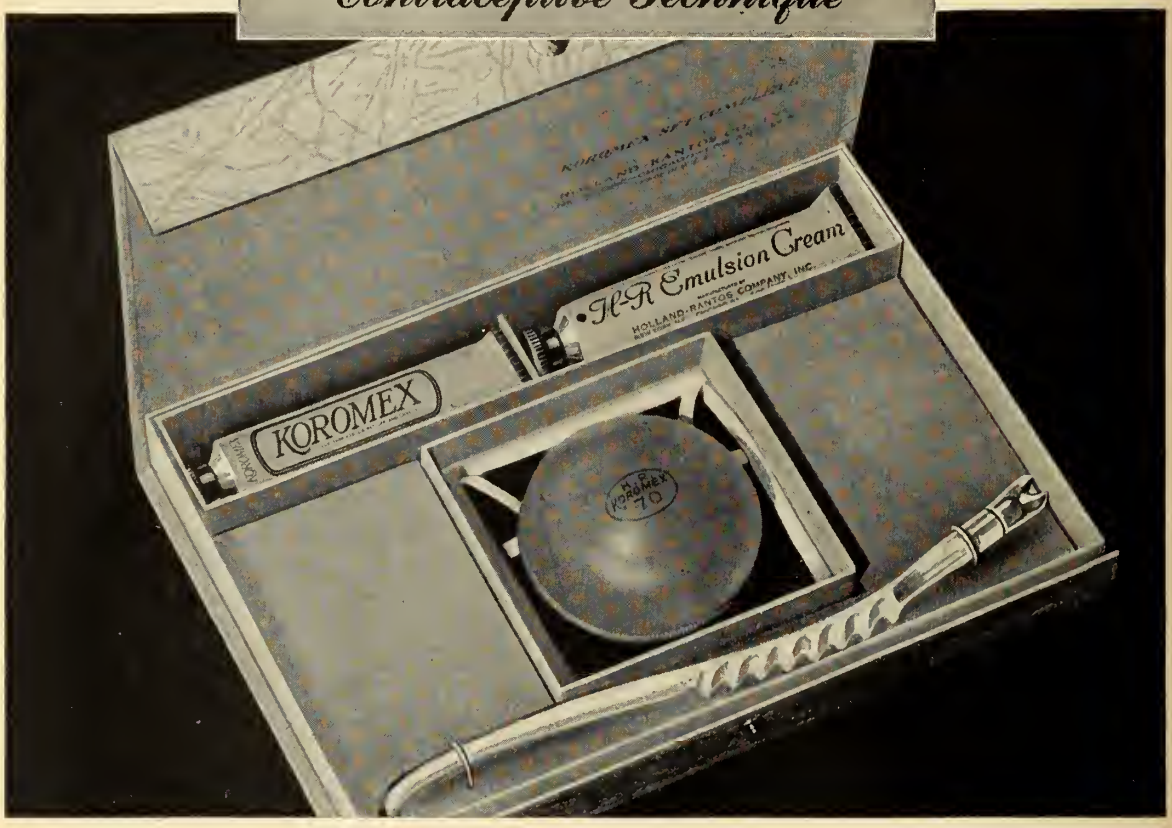
Prescribe one levelled tablespoon New Improved Dryco per pound body weight daily, plus sufficient carbohydrate to meet caloric needs. (One tablespoon Dryco supplies 31½ calories.)

Prescribe New Improved Dryco Regularly ACCEPTED AMERICAN MEDICAL ASSN. Council on Foods *Complete Information on Request*

BORDEN'S PRESCRIPTION PRODUCTS DIVISION

350 MADISON AVENUE • NEW YORK, N. Y.

A complete unit for Approved Contraceptive Technique



"THE KOROMEX SET COMPLETE"

Koromex Set Complete* is an attractively packaged unit containing the important items used for approved contraceptive technique. Identified by a removable label. To order or prescribe, merely write, "Koromex Set Complete, Diaphragm Size_____".

Each Unit Contains...

KOROMEX DIAPHRAGM—Widely accepted as the outstanding diaphragm in use today. Durable. GUARANTEED FOR 2 YEARS.

KOROMEX TRIP RELEASE INTRODUCER —Specially designed swivel tip facilitates usage. Gauged to take all size diaphragms.

KOROMEX JELLY and H-R EMULSION CREAM—Both preparations have equally high spermicidal value, but differ in degree of lubrication. Both are included so the patient may determine which preparation better meets her requirements and personal preferences

* *Price of Koromex Set Complete is only that of the Koromex Diaphragm and Koromex Trip Release Introducer*

Holland-Rantos *Company, Inc.*

551 FIFTH AVENUE, NEW YORK, N. Y.

Prepare for the perennial risk
of Rhus Dermatitis with

POISON IVY EXTRACT
Lederle

THE LOGICAL TIME for poison ivy immunization is in the late Spring. By timely action an immunity may be secured which will alleviate future discomfort from casual or prolonged contact with poison ivy. "Poison Ivy Extract *Lederle*" is useful not only for the prevention of rhus dermatitis, but also for its treatment.

Protect susceptible patients early!



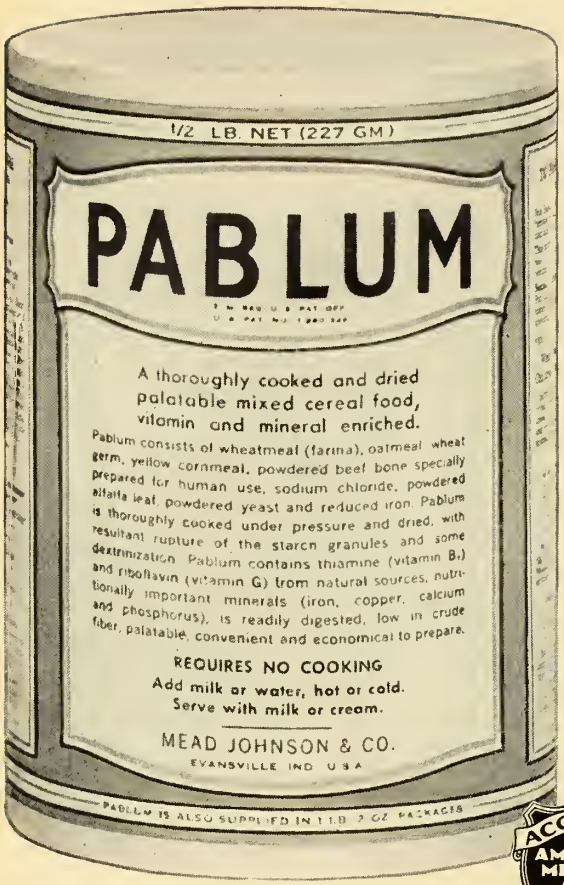
PACKAGES:
1 syringe of 1 cc.
2 syringes of 1 cc. each

Specify *Lederle*

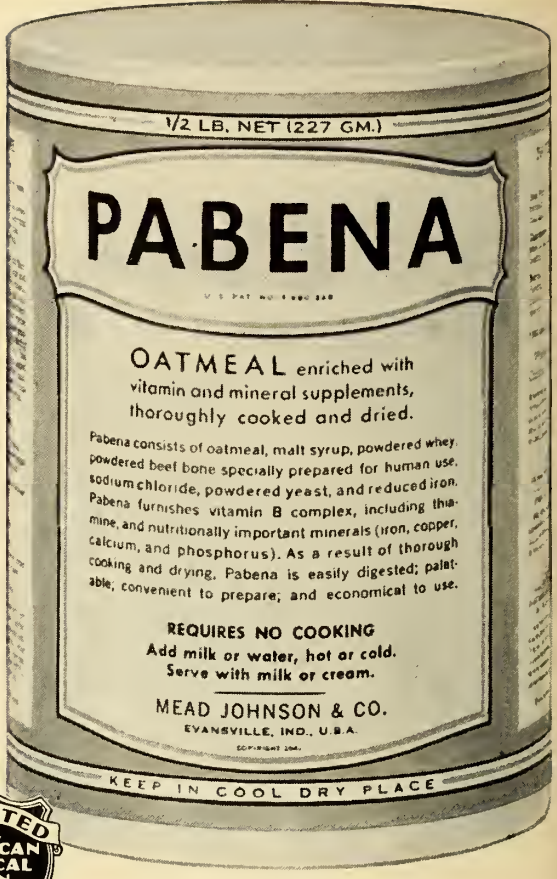
ARMY E NAVY

LEDERLE LABORATORIES, Inc., NEW YORK, N.Y. A UNIT OF AMERICAN CYANAMID COMPANY

1932 **1942**



8 oz.—1 lb. 2 oz.



8 oz. only

ACCEPTED by AMERICAN MEDICAL ASSN. Council on Foods

PABLUM, the pioneer precooked fortified infant cereal, now has a companion-product: Pabena is a precooked oatmeal cereal, lending variety to the infant's diet and offering the nutritional and convenient features of Pablum.

BOTH continue to be marketed and advertised only to the medical profession. Samples available on physicians' requests.

MEAD JOHNSON & CO., EVANSVILLE, IND., U.S.A.



IPRAL WILL PUT JAPS TO SLEEP

IPRAL* will induce a sound restful sleep closely resembling the normal. It can, of course, put the Japanese war lords to sleep —but . . .

Since Ipral is usually free from untoward after-effects when given in the customary therapeutic dosage and . . .

Since Ipral is readily absorbed and rapidly eliminated and . . .

Since the subject awakens generally calm and refreshed . . .

We suggest that Ipral—generally free from undesirable cumulative effects—be used to allay the sleeplessness of your own patients and that you purchase War Bonds to help our government buy toxic and fatal "knock-out drops" for use on the Axis powers.

* "Ipral" is a trade-mark of E. R. Squibb & Sons. Supplied as Ipral Calcium (calcium ethylisopropylbarbiturate) in ¾- and 2-gr. tablets and Ipral Sodium (sodium ethylisopropylbarbiturate) in 4-gr. tablets.

EVERYBODY EVERY PAYDAY AT LEAST 10%

Give the Axe to the Axis

Buy War Bonds and Stamps

Their Cumulative Effect is Beneficial

Member of American Drug Manufacturers Association



Such language!

My boss used to be as grumpy as a bear. He'd growl and bang around and his wife said: "Poor George, he's working too hard. It's wearing him down to a frazzle!"

So, I told her a few plain facts:

. . . how I'd discovered the most amazing thing . . . that physicians who prescribe S-M-A* actually have more time for other things . . . because it isn't necessary to change the formula throughout the entire feeding period. (She sat up at that.)

. . . how S-M-A eliminates many unnecessary questions that mothers usually ask about other modified milk formulas.



When I had finished, she said she would certainly speak to George about using S-M-A as a routine formula.

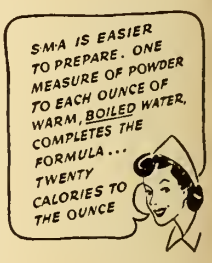
★ ★ ★

Just because my boss turned over a new leaf . . . he wants everybody to pat him on the back for it. But he's not fooling us . . . we know how he got to be such a nice man.

BUSY DOCTORS TODAY— PRESCRIBE S-M-A!

With the exception of Vitamin C . . . S-M-A is nutritionally complete. Vitamins B_1, D and A are included in adequate proportion . . . ready to feed. Their presence in S-M-A prevents the development of subclinical vitamin deficiencies . . . because the infant gets all the necessary vitamins right from the start.

S-M-A has still another highly important advantage not found in other modified milk formulas. It contains a special fat that resembles breast milk fat . . . resembles it chemically and physically—according to impartial laboratory tests. S-M-A fat is more readily digested and tolerated by most infants than cow's milk fat.



The infant food that is nutritionally complete

*REG. U. S. PAT. OFF.

SMA

ACCEPTED AMERICAN MEDICAL ASS'N Council on Foods

S. M. A. Corporation
8100 McCormick Boulevard
Chicago, Illinois

S-M-A, a trade-mark of S.M.A. Corporation, for its brand of food especially prepared for infant feeding—derived from tuberculin-tested cow's milk, the fat of which is replaced by animal and vegetable fats, including biologically tested cod liver oil; with the addition of milk sugar and potassium chloride; altogether forming an antirachitic food. When diluted according to directions, it is essentially similar to human milk in percentages of protein, fat, carbohydrate and ash, in chemical constants of the fat and physical properties.

THE RISING CURVE OF PEPTIC ULCER IN WAR

"Peptic Ulcer ranks high as a cause of disability for military service. It . . . leads all other digestive diseases as a cause for discharge from the Regular Army."

Kantor, J. L.: Digestive Disease and Military Service, Jnl. A. M. A., Sept. 26, 1942.

THE increased incidence of peptic ulcer among the armed forces, defense workers and civilians today confronts medicine as a major problem.

Of the various types of therapy used to control this problem none has proved itself more valuable than CREAMALIN, brand of aluminum hydroxide gel.

CREAMALIN, the first aluminum hydroxide gel to be made available to physicians, was also the first to be Council-accepted. CREAMALIN contains approximately 5.5% aluminum hydroxide.



ACCEPTED AMERICAN MEDICAL ASSN. Council on Pharmacy and Chemistry

CREAMALIN

REG. U. S. PAT. OFF.

Brand of Aluminum Hydroxide Gel

Therapeutic Effects of CREAMALIN

- **Pronounced antacid action of 12 times its volume of N/10 HCl in less than 30 minutes (Toepfer's reagent)**
- **Prolonged action in contrast to fleeting effect of alkalies**
- **Non-alkaline; non-absorbable: non-toxic**
- **No acid rebound; no danger of alkalosis**
- **Prompt and continuous pain relief in uncomplicated cases**
- **Rapid healing when used with regular ulcer regimen**
- **Mildly astringent; may reduce digestive action, thus favor clot formation**
- **Demulcent; gelatinous consistency affords protective coating to ulcer**

Modern non-alkaline therapy for peptic ulcer and gastric hyperacidity

ALBA PHARMACEUTICAL DIVISION
WINTHROP CHEMICAL COMPANY, INC.
NEW YORK, N. Y.
WINDSOR, ONT.

IN ADVISING YOUR PATIENTS ON SMOKING

Remember—Philip Morris claims come from completely reliable sources

THE *source* of findings counts as much as the findings themselves. PHILIP MORRIS *Cigarettes have been proved* definitely and measurably less irritating* to the nose and throat not by anonymous chemists, but by competent medical authorities whose studies have been published by leading medical journals.

Not only have *laboratory* tests shown PHILIP MORRIS to be superior, but *clinical* evidence as well has given complete corroboration.*

Only something *made* differently can produce a difference in *results*. And PHILIP MORRIS cigarettes are *made* differently.



PHILIP MORRIS

PHILIP MORRIS & CO., LTD., INC.
119 FIFTH AVENUE, N. Y.

**Laryngoscope, Feb. 1935, Vol. XLV, No. 2, 149-154. Laryngoscope, Jan. 1937, Vol. XLVII, No. 1, 58-60. Proc. Soc. Exp. Biol. and Med., 1934, 32, 241. N. Y. State Journ. Med., Vol. 35, 6-1-35, No. 11, 590-592.*



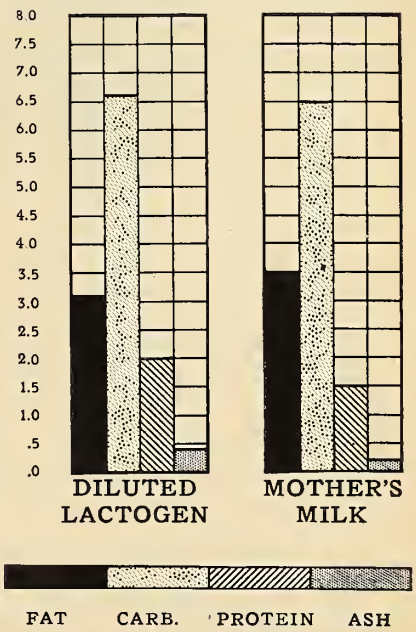


ACCEPTED AMERICAN MEDICAL ASSN. Council on Foods

LACTOGEN

approximates women's milk in the proportion of food substances

THE cows' milk used for Lactogen is scientifically modified for infant feeding. This modification is effected by the addition of milk fat and milk sugar in definite proportions. When Lactogen is properly diluted with water it results in a formula containing the food substances—fat, carbohydrate, protein, and ash—in approximately the same proportion as they exist in women's milk.



No advertising or feeding directions, except to physicians. For feeding directions and prescription blanks, send your professional blank to "Lactogen Department," Nestlé's Milk Products, Inc., 155 East 44th St., New York, N. Y.

"My own belief is, as already stated, that the average well baby thrives best on artificial foods in which the relations of the fat, sugar, and protein in the mixture are similar to those in human milk."

John Lovett Morse, A.M., M.D.
Clinical Pediatrics, p. 156.

NESTLÉ'S MILK PRODUCTS, INC.

155 EAST 44TH ST., NEW YORK, N. Y.



REST HOSPITAL

A quiet, ethical hospital with therapeutic facilities for the diagnosis, care and treatment of Nervous and Medical cases. Invites cooperation of all reputable physicians who may supervise the treatment of their patients.

PSYCHIATRISTS IN CHARGE
Dr. Hewitt B. Hannah
Dr. Joel C. Hultkrans

2527 2nd Ave. S., Minneapolis, Phone At. 7369

POKEGAMA SANATORIUM

operated by

H. LONGSTREET TAYLOR FOUNDATION

Reception Hospital



Thoroughly Equipped for the
Medical and Surgical Treatment of

TUBERCULOSIS

Artificial pneumothorax, oleothorax, phrenicectomy, thoracoplasty, pneumolysis, bronchoscopy, alpine lamp and heliotherapy. Operating, throat, dental and lamp rooms. Complete clinical and X-ray Laboratories.

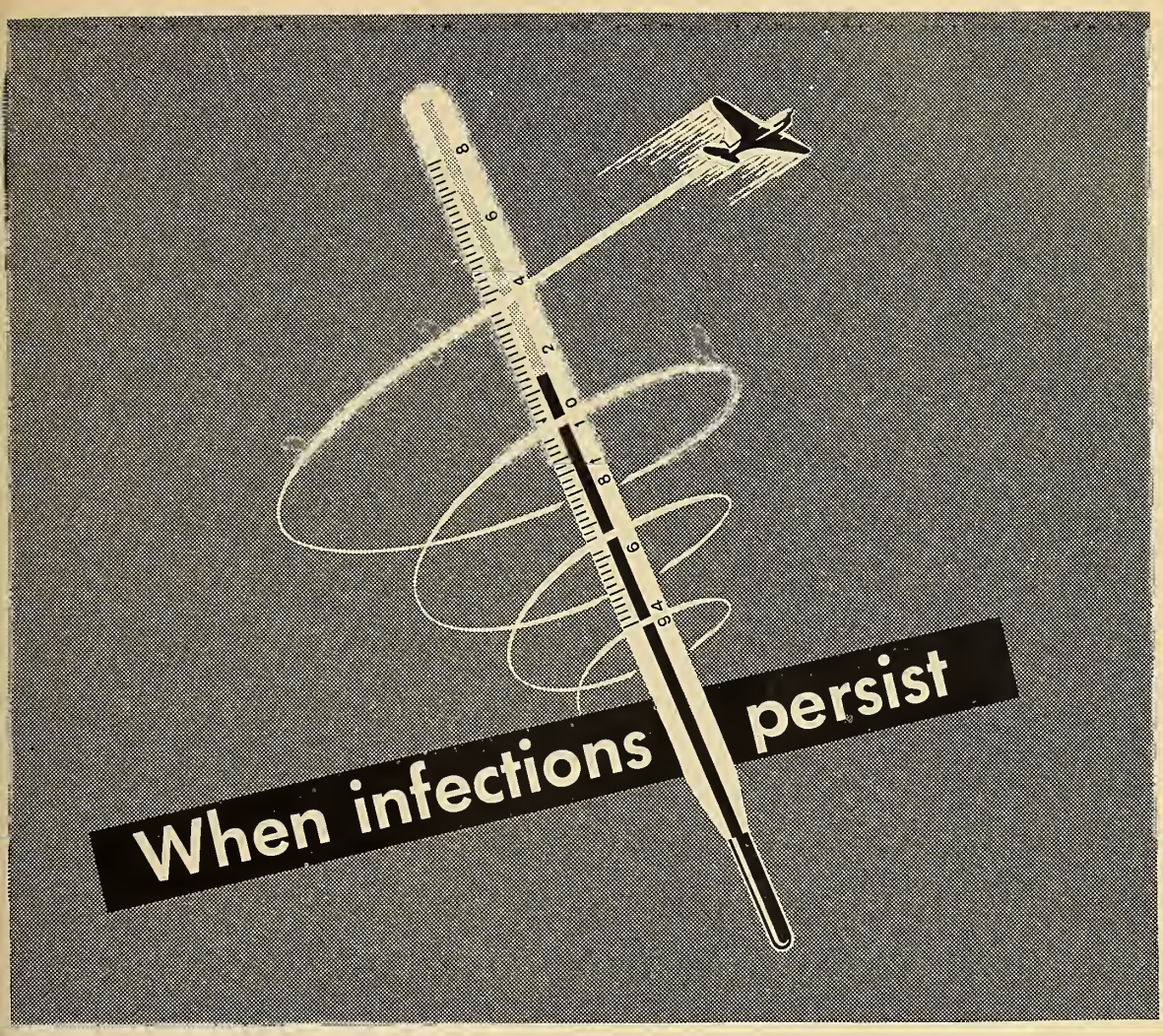
Electric Blankets in All Beds

A reduction has been made in rates.

Railroad, Bus, Telegraph and Telephone Stations: Pine City, Minn. Descriptive circular sent on request.

F. F. CALLAHAN, M.D., Medical Director
POKEGAMA, PINE COUNTY, MINN.

CHILDREN ADMITTED



When infections persist, careful study for symptoms of adrenal cortical insufficiency should be undertaken. The patient may show unusual asthenia and pronounced hypotension, in addition to low resistance to exposure and strain. ADRENAL CORTEX EXTRACT (UPJOHN) is a potent specific therapy now available for increasing resistance, muscle tone and capacity for work in adrenal cortical insufficiency.

Adrenal Cortex Extract (Upjohn)

Sterile solution in 10 cc. rubber-capped vials for subcutaneous, intramuscular and intravenous therapy

Upjohn
KALAMAZOO, MICHIGAN

ANOTHER WAY TO SAVE LIVES . . . BUY WAR BONDS FOR VICTORY

Hypo for an Embryo



ONE of the scourges of war was in retreat before a shot was fired in World War II . . . Vaccine to protect against typhus could be prepared in quantity sufficient for all. In the Lilly Laboratories farsighted planning had provided extensive experience with typhus Rickettsiae, and the yolk sac culture method was a workaday procedure. Within a few short days after war began, vaccine production was increased a thousandfold. No order has been refused and no fighting man denied typhus protection because of inadequate knowledge or lack of facilities for vaccine preparation.

Lilly

BUY WAR BONDS AND STAMPS

ELI LILLY AND COMPANY · INDIANAPOLIS, INDIANA, U. S. A.

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 June, 1943 No. 6

THE PHYSICIAN IN CIVIC LIFE

STEPHEN H. BAXTER, M.D.
Minneapolis, Minnesota

IN the First World War, after the St. Mihiel Campaign, the 5th Division of the U. S. Army, to which I was attached, went back into a training area for re-equipment and further training in preparation for the campaign in the Argonne—an interlude in the midst of war. One beautiful morning during this interlude I was lying in the sunshine on a grassy bank watching the maneuvers in the valley below, when I became conscious of a torrent of bird-song which permeated the atmosphere but which seemed to come from nowhere. I finally located the source of the song, a little bird poised high in the air, almost invisible and motionless except for the fluttering of its wings. It was my first introduction to the skylark, and it came during an interlude in the war. The meetings which we are holding here this week are another interlude in the midst of war—a period of refreshment, re-equipment and further training and preparation for the work that is ahead. And this banquet, with the ladies to add their beauty and charm, on the shore of this beautiful lake, amid these beautiful surroundings, is the skylark in the interlude.

The finances of our Association and the statistics relating to membership are matters of record. We take justifiable pride in the number of our members who are in the Armed Forces of the nation. Our Association and its members work in close harmony with the State Board of Health, and their combined efforts have resulted in a low record of maternal and infant mortality which is not equaled in any other state in the Union. The Association has conducted programs of popular education relating to vaccination and immunization and nutrition. It has initiated new plans for the control of tuberculosis which have attracted nationwide attention. All of these activities, and others not mentioned here, are worthy of more extended discussion but this is not an appropriate time or occasion for a full report of all that is being done or has been accomplished.

The Legislature met this year in its biennial session. As has been the custom for many years, our Association was represented at the Capitol by some of our own members who were entrusted with the responsibilty of watching bills as they were introduced in committees and of acting as spokesmen for the medical profession in matters relating to public health or medical practice. In the course of years of experience with these men, the members of the Legislature have learned to put confidence in them, to trust their judgment and to respect their honesty. It is not to be expected that there should never be a clash of opinions over some controversial matter. Such clash of opinions took place this year. Nothing would be gained by re-opening the controversy now or going into the details of the points at issue, but the controversy was given wide publicity, and it went so far that a resolution was presented to the Senate Committee calling for an investigation of the activities of the representatives of our Association at the

Presidential Address delivered at the ninetieth annual meeting of the Minnesota State Medical Association, Minneapolis, May 18, 1943.

Capitol. This resolution was not adopted, but it was widely publicized, and the very fact of its introduction created, in the minds of many people, impressions unfavorable to the Association.

The controversy with Governor Stassen was concluded amicably, and the Senator who introduced the resolution calling for an investigation, up to the present time, has not replied to a letter asking for specific charges of misconduct or the use of improper methods by men representing our Association. This recent incident may, therefore, be considered as closed, but it, together with the presence of Dr. Judd as our honored guest and the principal speaker on this program, naturally directed my thoughts to the physician in politics as a pertinent and timely subject for consideration this evening.

It is inherent in the minds of men of scientific medical training, that they should be independent and non-conformists. In the medical schools during the Revival of Learning were found the best opportunities for the study of all the sciences, whether it be Medicine or Chemistry or Physics or Astronomy. Astrology became scientific astronomy in the hands of Copernicus, a Pole, and Galileo, an Italian, both students of medicine. Naturally, ecclesiastical authority and the authority of Galen, which had ruled medical thought through the thousand years of the dark ages, surrendered only after a struggle. It required courage of a high order to revolt against such authority. "The scientists and philosophers of the middle ages were allowed the high privilege of showing, by logical process, how and why that which the Church said was true, must be true, and if their demonstrations fell short of, or exceeded this limit, the Church was maternally ready to check their aberrations, if need be, by the help of the secular arm." (Huxley)

One can appreciate, therefore, the courage of Henry of Mandeville when, in the 13th Century, he exclaimed, "God surely did not exhaust all his wisdom in the creation of Galen." But even 400 years later, so great was the power of authority that Harvey wrote that he "felt in some sort criminal to call in question doctrines that had descended through a long succession of years and carried the authority of the ancient," but that he "appealed unto Nature that bowed to no antiquity and was a still higher authority than the ancients."

It is characteristic for scientists to revolt against tyranny of any kind, for tyranny and the freedom demanded by Science are mutually incompatible. Therefore, it is only natural that medical men should be found fighting not only for intellectual freedom, but for political freedom. Warren, who was killed at Bunker Hill, was a physician. Twenty-one members of the first Provisional Congress of Massachusetts were medical men. Six doctors signed the Declaration of Independence and three signed the Constitution of the United States. General Leonard Wood, a great military leader and still greater colonial administrator, was a physician, as was Clemenceau, who led the French nation through the first World War. The list would include such names as Henry Dearborn, for whom Fort Dearborn was named, a Major General of the U. S. Army and Secretary of War from 1801 to 1809. William Henry Harrison, at one time a student of medicine, became a President of the United States. The roster of medical men, who have been distinguished in the political life of this and other countries, would include many of the great names of history. I make no attempt this evening to give a comprehensive list of medical men who have become soldiers or statesmen, but any list, however incomplete it may be, should include the name of Sun Yat Sen, the physician who became the first President of the Republic of China. The name of China is inextricably linked with the names of men who have gone to China, not to exploit the country and its people, but to help and advise them. These men have contributed to the making of China what it is today, one of the strongholds of the world against tyranny and aggression. So our list must include the name of Walter Judd whom we delight to honor this evening; and in honoring him we do honor to ourselves, for he is a member of our Association who has already won a distinguished place in the field of politics and statesmanship.

No apologist, therefore, is needed to defend medical men who interest themselves in politics. Laws do not operate automatically and the machinery of government will not run itself. Someone must administer the laws, someone must operate the machinery, and who should be better qualified to do those things than men who have had a scientific education, and who are trained to draw conclusions in accordance with known facts; who follow the dictum of a famous naturalist, most of whose work is now obsolete, but

who left one phrase worthy of immortality, "Let us gather some facts, in order that we may have some ideas." (de Buffon)

If further defense were necessary in order to justify medical men in taking an active interest in government and in practical politics, the testimony of a practical politician may be pertinent, for he might naturally look askance and with a jealous eye at the invasion of his field by men who are idealists and who are apt to be nonconformists, independent and intractable. Senator Burton, of Ohio, in an address before a meeting of medical men this spring advocated the establishment of a center or office in Washington, manned by men representing the best statesmanship of the medical profession, to whom members of Congress might go for wise counsel on matters pertaining to the practice of medicine and the relations of the medical profession to the public. Such advice from such a source certainly justifies the kind of representation that our Association maintains at the Capitol when the Legislature is in session.

After all, isn't an active interest in civic affairs (politics, if you please to call it by that name) of the essence of civilization? Civilization simply means being reclaimed from barbarism and acquiring the disposition to live civilly in communities, at peace with one's neighbors and respecting their rights. Civilization is not a goal which can be reached and beyond which further advancement is impossible, but it is a process of development. At its pinnacle, at any given time, is what we may call culture, implying not only learning and technical skill, but also the possession of an ideal and the habit of critically estimating the value of things. It has nothing to do with Kultur (capital K, a good word prostituted to a bad use), because the ideas of science are never put into motion by force and tyranny. Therefore, the nadir of German civilization and culture was struck, not last year, nor in 1941, but ten years ago, the tenth of May, when the government of that nation caused the burning of books with which the party then in power disagreed. Bearing in mind that lapse into barbarism, the crime of Lidice and the horrors of the Ghetto of Warsaw and holocaust of Rotterdam are understandable. But in spite of those crimes and of that recrudescence of barbarism and savagery, we can still acclaim the greatness of Goethe and Beethoven and Koch; in spite of the treachery of the Japanese at Pearl Harbor and in spite of the cold-blooded murders of helpless prisoners of war, in spite of the savage sinking of a hospital ship, which all civilized nations recognize as immune from attack, we can still accord first rank in science to men named Noguchi and Kitasato. We take pride in being able to do this, for it is a proof that we are civilized and have some degree of culture, and in our ability to do it lies the best hope of victory in the war, for barbarism has never been able to stand against the advance of civilization, nor tyranny against the will to be free.

It may appear that a comparatively trivial incident at the Capitol this spring has taken my thoughts far afield. But this trivial incident gave us an indication of the power and influence of our profession in civil affairs. The possession of that power is a sacred trust. It entails responsibility which we cannot evade. Following many illustrious examples of medical men in politics, let us accept the responsibility and utilize our power, as individuals, each in his own community, and as an organization, to advance the cause of better government at home and of civilization the world over.

POSTWAR RELIEF

In the three years following the last war more people died from famine and preventable disease than were killed in the war itself, hence the importance attached to the present organization of postwar relief. The principal regional medical officer, British Ministry of Health, holds that the lives and health of millions in Europe as well as the physique and welfare of a generation to come depend on how well this preparatory work is done. He visualizes four principal problems—the provision of food, the supply of medical necessities, the control of such diseases as typhus, malaria, tuberculosis, and dysentery, and the reëstablishment of the medical, hospital, and public health services in each country.—*Ed. Jour. Royal Inst. Pub. Health & Hyg.,* (Mar.) 1943.

THORACIC INJURIES

THOMAS J. KINSELLA, M.D.
Assistant Clinical Professor of Surgery
University of Minnesota Medical School
Minneapolis, Minnesota

CHEST injuries of serious degree, which fortunately occur relatively infrequently in civil practice, become in wartime a matter of major surgical importance. Modern all-out war strikes not only at the armed forces which are prepared to meet such conditions but all too often at civil centers hundreds of miles distant from the front and may at any time confront a city and its surgeons with numerous serious casualties of a new and unfamiliar type.

During the first World War thoracic wounds constituted 6 per cent of the eleven million casualties reported for the English, French, German and American forces. The general mortality for this whole group was 8 per cent; that from thoracic injuries alone was 56 per cent. The American Army in the first World War sustained approximately 175,000 battle injuries exclusive of those produced by gas, and of this group 2.6 per cent were thoracic injuries. The general mortality for all battle casualties was 7.73 per cent; that of thoracic injuries was 24.05 per cent. The serious nature of thoracic wounds is well illustrated by the figures quoted by Sauerbruch, in the last War, who stated that of 300 soldiers dying on the battlefield 37 per cent had chest wounds. Duval reported a 30 per cent mortality from thoracic wounds in the advanced dressing station, with 25 per cent in the ambulance and only 15 per cent in the Army hospitals.

For convenience of discussion, thoracic injuries may be divided into three general groups: (1) compression or crushing injuries; (2) closed penetrating injuries; (3) open penetrating injuries. Each of these will be discussed in turn.

There are distinct differences in the type and character of thoracic wounds as observed in civilian and war work. In civilian practice crushing injuries of the chest are seen not infrequently, as a result of automobile accidents, falls, cave-in of excavations and collapse of buildings. Penetrating wounds are usually of the closed type, as a result of a stab by a knife or an ice-pick, from a splinter of glass or wood or a bullet of small calibre from a pistol or rifle. The open penetrating type of wound is rather rare. The damage to tissue is less extensive and the condition of the patient and his clothing is such that contamination is less marked and infection follows less frequently, in only 1 to 2 per cent in some series. Conditions in this group are much more favorable for a conservative program of treatment.

War injuries on the other hand are likely to be more extensive and of greater severity. Crushing injuries from the same types of accidents occur with the addition of the devastating effects of explosive blasts. Penetrating injuries are more likely to be of the open than the closed type, from bayonet wounds, from bullets of larger calibre, from shell fragments and flying debris. The wounds themselves are frequently more extensive, tissue damage is much greater, and open pneumothorax is more common. The local conditions of the patient, clothing and the missle itself are such that contamination is infinitely greater, and retained foreign bodies, including fragments of clothing and dirt of all types, are frequently observed which encourage the subsequent infection of the part. Indications for surgical intervention are frequently observed and operation must be carried out in many of these patients as soon as their condition will permit if they are to be saved.

The following principals of treatment of thoracic injuries are fundamental and must be observed at all times. They are: (1) control of hemorrhage; (2) treatment of shock; (3) restoration of the cardio-respiratory physiology to normal as rapidly as possible.

Compression or Crushing Injuries

This type of injury may vary greatly in severity from a simple compression or squeeze without serious damage to an extremely severe crushing of the whole chest and its contents. The injury to bony structure may vary from simple fracture of one rib to multiple fractures of

Read in Symposium on Emergency Surgery at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 1, 1942.

many or even all of the ribs, and even the sternum. The ordinary crushing injury to the chest causes a fracture of the ribs in an outward direction at the point of their greatest convexity and rarely produces lung injury from spicules for this reason. Lung injuries from fractured ribs are more likely to occur from a more localized blow which forces the rib inward fracturing it as is seen following a fall against a sharp corner or some similar injury. A severe crushing injury may be immediately fatal from rupture of the heart or great vessels by compressing them between the sternum and the spine. In less severe crushing injuries the possibility of injury to these structures may be overlooked because the chest wall springs back into place and one fails to appreciate the amount of compression which actually occurred. The shock may be slight or severe, or even of an extreme degree. Intrapleural hemorrhage may or may not occur but is a frequent complication of all types of thoracic injuries. The bleeding may be small in amount from slight injury to small vessels or may be extremely large or even fatal, the patient exsanguinating himself by bleeding continuously into the pleural cavity from an intercostal, an internal mammary or one of the larger vessels.

Traumatic spontaneous pneumothorax may not occur but is seen quite frequently if search is made for it. It may be small in amount or may be extensive. The possibilities of tension pneumothorax must be kept in mind at all times and the excess pressure relieved immediately or serious effects may follow. Tension pneumothorax alone may bring about a fatal outcome if unrelieved. Subcutaneous emphysema is frequently a painful but not a serious complication, although at times it may become rather alarming in extent. An occasional case of mediastinal leakage may not only give extensive subcutaneous swelling but may seriously embarrass the patient by compression of the soft walled vessels in the mediastinum.

Treatment

The treatment of such injuries may be briefly outlined as follows:

1. Avoid additional injury in moving the patient.

2. Shock if present must be treated thoroughly and adequately, by posture, heat, control of pain, and, if necessary, by prompt intravenous injection of serum, plasma or blood.

3. Proper position of the patient is important. If he is in shock, the head down position is imperative to avoid cerebral anemia. If shock is not present the patient with a thoracic injury is frequently much more comfortable if propped up at an angle of approximately 30 degrees. Breathing is much easier in this position.

4. If the chest wall is soft because of the injury or paradoxical breathing is occurring as in the case of multiple fractures, the chest wall must be immobilized and the paradoxical motion stopped by use of sandbags or adhesive strapping to prevent further respiratory embarrassment.

5. Pain should be controlled promptly by adequate doses of morphine, which in these injuries may require the use of a half a grain to a grain by hypo. Novocain block of the intercostal nerves of the injured segments may not only add greatly to the patient's comfort but may be followed by a prompt recovery from shock.

6. The patient must be carefully watched for intrapleural bleeding, which is of frequent occurrence. Usually the amount is small, but the bleeding may continue and the blood loss may become serious. In general the policy is to avoid aspiration early, allowing the pressure of the accumulating blood to control the bleeding if possible. Early aspiration may be followed by a recurrence of the bleeding which originally stopped spontaneously. After a few days aspiration may be done without such risk. Removal of the blood from the pleural cavity is usually advisable later to avoid thickening of the pleura and binding down of the lung with later restriction of respiratory activity. Unless there is considerable trauma to local tissue, blood which enters the pleural cavity does not clot. If necessary, this blood may be aspirated, citrated and injected into the patient's veins.

Progressive intrapleural bleeding may at times be controlled by aspiration of the blood and the establishment of a therapeutic pneumothorax, if the bleeding is coming from the injured lung itself. If the bleeding arises from an injured intercostal or internal mammary vessel such a procedure probably would be of little value. If the bleeding is progressive and its source cannot be ascertained readily, some information on the subject may be obtained by the establishment of

an artificial pneumothorax and the visualization of the interior of the chest by means of a thoracoscope. This will help to localize the site of the bleeder which may demand surgical control. If blood loss intrapleurally has been appreciable, transfusions of serum, plasma or whole blood may become necessary. Serious bleeding from an intercostal or internal mammary artery may have to be controlled surgically under local anesthesia in spite of shock if the patient is to be saved.

7. Tension pneumothorax must be borne in mind at all times and its development detected promptly. Increasing dyspnea and cyanosis, displacement of heart and mediastinum, with a tympanitic percussion note over the one side, should enable one to make the diagnosis without x-ray confirmation. Decompression of the tension pneumothorax is followed by immediate, marked improvement in the patient's condition and may be life saving. The possibilities of its recurrence after it is once relieved must be borne in mind, and facilities provided at the bedside for immediate aspiration of air if necessary or even for the introduction of an intercostal drain connected to a break-over valve to prevent the development of intrapleural pressures above atmospheric. In this connection it must be borne in mind that a pneumothorax pocket which is not embarrassing the patient may at reduced pressures as in air transport at high altitudes become a tension pneumothorax of serious degree. With the frequency of air travel and air transport of injured people, this factor must be recognized by physicians at all times.

8. Oxygen administration may be life saving in many serious thoracic injuries and should be used if available for all patients with dyspnea and cyanosis. It is well to remember, however, that oxygen administration will not compensate for, nor correct the embarrassment brought about by a tension pneumothorax.

9. If the sternum and attached rib cartilages have been depressed by a crushing injury and have not sprung back to their original position it may be necessary to elevate the sternum and depressed portion of the thoracic cage surgically by the use of traction, and to maintain it in this position by some means of fixation. Occasionally a shattered rib, particularly one which is splintered and whose ends are traumatizing the lung may have to be removed surgically before its deleterious effects can be overcome.

Closed Penetrating Wounds

Closed penetrating wounds occur most commonly from the entrance of some small object into the chest and as a rule are not accompanied by extensive damage to intrathoracic structures unless the heart or one of the great vessels happens to be injured. The patient may apparently have sustained little injury from the accident and may be in excellent condition. Except for certain specific instances this type of wound lends itself readily to conservative treatment with a very good chance of successful outcome and with a rather small risk of secondary complications. Such an attitude should in general be adopted for the handling of a majority of such cases, watching very carefully, however, for complications which may indicate surgical interference.

Treatment

1. Shock, if present, must be thoroughly treated by all means, using serum, plasma or blood if necessary.

2. Careful watch must be kept for signs of internal bleeding. If it occurs in small amounts only a conservative attitude may be justifiable. If progressive or extensive, surgical control may be mandatory.

3. Watch for cardiac tamponade. Any injury in the region of the pericardium should immediately suggest to the surgeon the possibility of injury to the heart with intrapericardial bleeding. The clinical picture of cardiac tamponade is the result of increasing pressure within the pericardium from rapid, progressive bleeding into the pericardial sac, with compression of the thin walled vessels at the base of the heart and interference with diastolic filling. The picture is quite characteristic and rather readily recognizable. The condition itself is one which if promptly recognized and adequately treated surgically may result in the saving of a number of lives which otherwise would be lost. The typical picture includes a history of injury in the region of the heart usually followed by an immediate gush of blood which may cease spontaneously. The patient may then be free of symptoms for a short period of time following which there is rapid collapse and unconsciousness. The pulse be-

comes weak, the blood pressure is low, the heart tones are very faint, the venous pressure rises high, and unless something is done to relieve the tamponade the patient may die within a short period of time. Under the fluoroscope little or no heart motion is to be observed. Aspiration of the pericardial sac may tide the patient along until the surgical setup can be completed but ordinarily one should except a recurrence of the tamponade within a short period of time. Surgical exploration of the pericardium relieves the pressure while prompt suture of the bleeding points has proven a life-saving measure in a considerable number of recorded instances.

4. Recognize and decompress tension pneumothorax. The occurrence of pneumothorax should be suspected and a careful search made for it. If it is not embarrassing the patient no active treatment may be indicated at the time. If there is any sign of tension pneumothorax, however, the pressure must be relieved either by aspiration or the institution of closed drainage, to avoid the serious consequences of an unrelieved tension pneumothorax.

5. Surgical intervention while ordinarily avoided in most closed penetrating injuries becomes necessary or even mandatory under the following conditions:

(a) To relieve cardiac tamponade.

(b) To control serious or persistent intrapleural hemorrhage.

(c) To remove a foreign body from the lung substance or the region of the great vessels. The removal of a foreign body can wait until the patient's general condition has improved sufficiently so that thoracotomy may be undertaken without undue risk.

(d) The control of continued air leakage from the torn lung. In some instances it is necessary to suture such a lung injury.

(e) To repair a laceration of the bronchus or esophagus. Such injuries are particularly dangerous because of the contamination which attends them. Surgical repair should be undertaken early, not only to prevent further contamination but also to control air leakage and the tension pneumothorax or emphysema which may follow.

The results of the treatment of closed penetrating injuries are quite satisfactory if a conservative attitude is adopted and surgical intervention limited to specific indications.

Open Penetrating Wounds

Open penetrating wounds of the thoracic cage in both civilian and war work are of major importance and potentially very dangerous to the patient. They not only represent serious damage to the chest wall and intrathoracic organs but induce grave secondary symptoms by seriously disturbing respiration and cardiac action, and present great possibilities of serious infection subsequently. Because of the nature of the wound, its extent, and the secondary effects produced, they are frequently accompanied by marked shock, and present conditions which if not immediately relieved may lead to a prompt fatal outcome. They require prompt emergency treatment to control hemorrhage, to overcome shock and to rapidly return the cardiorespiratory system to normal or thereabouts as rapidly as possible. Any delay in administering emergency treatment may mean the loss of the patient. There are four points in the emergency management of these injuries which may well prove life saving:

1. Control of hemorrhage. If possible all bleeding points must be controlled by clamping, ligature, suture or packing.

2. A sucking chest wound must be closed promptly, by any means at hand. If sterile gauze is available it may be packed tightly and sealed by adhesive or temporary suture, but some method must be devised to stop the external suction, for if the opening is of much size the patient will not long survive a sucking wound. Plastic closure of the opening must await a more favorable time.

3. Adequate doses of morphine, at least a half to one grain, must be given to relieve pain and dyspnea. A patient with an open sucking wound develops marked dyspnea with a struggling type of respiration which merely tends to exaggerate this respiratory difficulty. The slow, quiet breathing which the patient has under morphine narcosis may permit adequate ventilation without inducing the mediastinal turmoil which attends a struggling type of respiration.

4. Proper measures must be taken for the treatment of shock, which in these cases is likely to be severe. Prompt administration of serum, plasma or blood intravenously is indicated even at the scene of the accident, and oftentimes should be done before any attempt is made to transport the patient. Relief of pain, application

of external heat, closure of an open sucking wound, and the other standard measures used in the treatment of shock are all indicated.

5. Local implantation of chemotherapeutic agents into the wound should be considered as there is a high incidence of contamination and subsequent infection in open penetrating wounds. The local use of sulfanilamide, sulfathiazole or both into the wound at the scene of the accident may be of value, but caution must be observed as the absorption of any chemical agent from the pleural cavity is rapid, and doses in excess of from five to eight grams may prove toxic.

6. Transportation. After the above measures have been applied the patient must be moved to the hospital where more adequate treatment may be administered, protecting him against all additional trauma during the course of such transportation. Here as in other cases involving pneumothorax it is well to remember the effect of higher altitudes on pneumothorax pockets, particularly in patients with a limited respiratory reserve, and to take proper precautions to prevent the development of a tension pneumothorax. Needless to say, the most rapid means of transportation to the hospital where adequate surgical facilities are available is to be recommended, all of the points taken into consideration.

7. Oxygen administration is frequently advisable and may be life-saving in its effect. However, it must be used intelligently, and the fact that it will not relieve all respiratory difficulties must be recognized.

8. When and if the patient can be transported to a hospital with adequate surgical facilities and his condition becomes satisfactory to permit thoracotomy, the lacerated wound should be excised, a thorough débridement performed, foreign bodies removed from lungs and pleural cavity and closure of the chest wall performed. In some instances the lung will be so damaged that partial or complete lobectomy probably by a tourniquet technique with mass ligation will be necessary.

9. Plastic closure. The surgical problem of closure of a chest wall defect may at times be complicated, depending upon the amount of soft tissue and chest wall which was damaged in the original accident. If at times a portion of the chest wall must be excised because of being shattered or the tissues destroyed it may be necessary to transplant the pectoralis major or latissimus dorsi muscle to close the defect with partial transplantation of one or more ribs in order to stabilize the soft spot left in the chest wall. An airtight closure must be provided to avoid the injurious effects of a sucking wound. The possibility of some such plastic closure must be kept in mind when an incision is made to open the chest cavity in case of an injury and care taken to preserve all structures which may be of value in reconstructing the chest wall.

10. Because of the prompt occurrence of a pleural effusion following intrathoracic injury and manipulation, some type of drainage, preferably of the closed type, must be instituted at the completion of the operation, for large effusions are likely to form and tension from them must be relieved promptly. This is more readily accomplished by closed drainage than by repeated aspiration and with less discomfort to the patient. Likewise, the closed drainage tube with constant negative pressure postoperatively will be of value in obtaining expansion of the remaining portions of the lung, more rapid obliteration of the pleural cavity and providing drainage for the empyema which not infrequently follows such an injury.

All open penetrating wounds of the chest are extremely serious injuries, and potentially very dangerous to the life of the patient. Some simple emergency surgical measures may be life-saving and tide the patient along to the time when more radical intrathoracic surgery may be performed to save the patient from an injury which under ordinary circumstances would be inevitably fatal. The man doing general surgery must be educated concerning the physiology of respiration and the mechanisms in play in any intrathoracic trauma. To the general surgeon, even in war work, must fall the task of the emergency treatment of these injuries and upon his knowledge and skill may depend the life of a patient who has sustained such a serious injury.

ABDOMINAL INJURIES

M. G. GILLESPIE, M.D.

Duluth, Minnesota

THE abdominal cavity, considering the importance of the organs situated therein, is probably the least protected and consequently the most easily injured of all body cavities.

Because of their usual complexity, the multiplicity of organs involved, the frequent association of other severe injuries, and commonly the presence of shock, injuries of the abdomen offer difficult diagnostic as well as therapeutic problems and are frequently associated with serious complications which entail a high mortality rate.

Nonpenetrating blunt force, or penetrating, wounds of the abdomen always carry the potential dangers of serious hemorrhage and peritonitis. These two complications and the frequent association of shock are the ones which so seriously imperil life.

Since shock is present in about 33 per cent of cases of abdominal injuries, and since 50 per cent of those in shock die, one can readily appreciate how important it is to distinguish early between shock without severe hemorrhage and shock following severe bleeding, and to institute early the proper supportive therapy, whether it be the use of whole blood, serum or plasma, until such time as a decision can be made whether the injured shall be treated by conservative measures or by operation.

An abdominal injury is a serious condition whether it occurs in civilian life or in war. In civil life, the automobile is the implement most frequently involved. In war, quoting Storck, "The general category of gunshot wounds of the abdomen, includes not only injuries due to bullets fired from rifles, revolvers or machine guns, but those wounds peculiar to warfare which are caused by fragments of shells, bombs and hand grenades, as well as the blast injuries produced by detonation of high explosives." I might emphasize that in total war these wounds are not confined to the military but occur to the civilian as well—men, women and children. According to Gordon-Taylor, in the present war, in one series of abdominal cases, 78 per cent were men, 20 per cent women and 2 per cent children.

These injuries were produced not alone by projectiles from rifle, machine gun and bomb, but also by flying missles of metal, splinters of wood and glass, falls, falling masonry, and blast concussion.

The gravity of the abdominal injuries of the present war is attested by the statement of Gordon-Taylor when he stated, "Only 50 per cent of the patients with an abdominal injury, for whom operation is possible, survive."

Abdominal injuries in civil life are also associated with a high mortality. Such is the case largely because of the frequency of associated multiple injuries which are inevitably and rapidly fatal.

Clinically, according to Estes, abdominal trauma may be classified into three groups: (1) severe multiple injuries which are rapidly fatal and for which no treatment is of avail; (2) cases that obviously require immediate operation; (3) cases in which the diagnosis is doubtful and the indications for or against operation are not clear.

In the first category fall most transportation accidents, the automobile being the most frequent causative factor.

In the second and least common group, those requiring immediate operation, occur most penetrating injuries, of which the commonest are gunshot wounds.

In the third or final group fall most of those due to blunt force, therefore nonpenetrating. They are most commonly due to blows or falls.

There were 2,483 accidental deaths, suicides and homicides in Minnesota during the year 1941. Of these, there were 787 transportation accidents, of which those due to the automobile made up the largest number. There were 570 deaths from falls and fifty-one from firearms. These three modes of accidental deaths, suicides and homicides comprised over 50 per cent of the total.

Thus we can predict that automobile accidents, blows, falls, and gunshot wounds will be the most frequent causes of abdominal injuries.

An analysis of the abdominal injuries occur-

From the Department of Surgery, The Duluth Clinic, Duluth, Minnesota. Read in Symposium on Emergency Surgery before the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 1, 1942.

ring in the decade 1930-1940, admitted to St. Mary's and St. Luke's Hospitals was undertaken.

During this time there were eighty-five abdominal injuries; sixty-five of these occurred in males and twenty in females (Table I).

TABLE I. AGE INCIDENCE

1930-1940

Males (average age 30)	65
Females (average age 31)	20
Total	85

Motor vehicle accidents comprised 35 per cent, accidental falls and blows 35 per cent, gunshot and stab wounds 15 per cent and miscellaneous accidents 15 per cent (Table II).

TABLE II. CAUSES OF INJURY

Motor vehicle accidents	30
Accidental falls	17
Blows	12
Firearms	6
Suicide with firearms	3
Stab or puncture wounds	3
Railroad accidents	2
Miscellaneous	12
Total	85

In forty-five or slightly more than 50 per cent, the abdominal wall alone was injured. In the group of intra-abdominal traumas, there were frequently multiple injuries, the liver being the most commonly injured, the kidney second. Other less frequent injuries were lacerations of the intestine, retroperitoneal hemorrhage, injuries to the spleen, et cetera (Table III).

TABLE III. AREAS AFFECTED

Abdominal wall	45
Liver	11
Kidney	8
Spleen	3
Intestines	5
Mesentery	2
Retroperitoneal hemorrhage	5
Ruptured bladder	1
Traumatic appendicitis	1
Miscellaneous	4
Total	85

Associated injuries occurred in forty-three or 50 per cent of the cases (Table IV). Of these twenty-four were considered of a minor and nineteen of a major character. Of the major associated injuries six involved the thorax and in sixteen there were associated fractures of the extremities, pelvis, skull, spine or the thoracic cage.

TABLE IV. ASSOCIATED INJURIES

Abdominal injuries total		85
Associated injuries	(50%)	43
Minor		24
Major		19
Thorax		6
Fractures		16

There were twenty-two deaths (Table V). The chief cause of death in the autopsied group was hemorrhage and the next most frequent cause was peritonitis.

TABLE V. MORTALITY

Deaths	(25%)	22
Autopsies		17
Causes of death		
Hemorrhage		10
Peritonitis		5
Atelectasis and bronchopneumonia		1
Arteriovenous aneurysm		1

Sixty-two were treated conservatively, with sixteen deaths, or a mortality of 25 per cent (Table VI). In the operative group there were twenty-three patients so treated, with six deaths, or 25 per cent.

TABLE VI. MORTALITY FOLLOWING TREATMENT AND SHOCK

Nonoperative treatment		62
Deaths	(25%)	16
Operative treatment		23
Deaths	(25%)	6
In shock		30
Deaths	(50%)	16

Half of the injured who were in shock died.

In the penetrating wounds of the abdomen, there were six deaths, or 33 per cent, while in the nonpenetrating injuries there were sixteen deaths, or a mortality of 25 per cent (Table VII).

TABLE VII. MORTALITY ACCORDING TO TYPE OF WOUND

Penetrating wounds		18
Deaths	(33%)	6
Nonpenetrating wounds		67
Deaths	(25%)	16

Summary

1. A series of patients with abdominal injuries admitted to St. Mary's and St. Luke's Hospitals in the decade 1930-1940 was analyzed.

2. The young adult male is the most frequently injured.

3. The automobile, falls, blows and gunshot wounds are the most frequent causative agents in civilian life.

4. In about 50 per cent of injuries the abdominal wall alone is traumatized. Intra-abdominal injuries frequently are multiple, the liver being the most commonly injured.

5. Associated injuries occur in about 50 per cent of cases.

6. In this series, there was a 25 per cent mortality rate, alike in those treated conservatively and those subjected to operation. Fifty per cent of all patients in shock died.

7. Penetrating wounds were associated with a mortality of 33 per cent compared to 25 per cent in the nonpenetrating injuries.

8. The mortality for the entire series was approximately 25 per cent. The most common causes of death in the autopsied group were hemorrhage and peritonitis.

References

1. Bancroft, Frederic W.: The traumatic abdomen: nonpenetrating and penetrating wounds. Indus. Med., 9:285-294, (June) 1940.
2. Besley, Frederic A., Mulholland, John H., Bailey, Fred W., and Storck, Ambrose H.: Principles of surgical practice. (Abdominal Traumas, Panel Discussion.) Surg., Gynec. and Obst. with Intn'l. Abst. Surg., 73:299-306.
3. Estes, William J., Jr.: Nonpenetrating trauma of the abdomen. Surg., Gynec. and Obst., 74:419-424, (Feb. 16) 1942.
4. Gordon-Taylor, Gordon: The problems of surgery in total war: with special reference to abdominal injuries. Surg., Gynec. and Obst., 74:375-401, (Feb. 16) 1942.
5. Poer, D. Henry, and Woliver, Edward: Intestinal and mesenteric injury due to nonpenetrating abdominal trauma. Jour. A.M.A., 118:11-15, (Jan. 3) 1942.
6. Storck, Ambrose H.: Penetrating wounds of the abdomen: an analysis of forty-six personal cases. Ann. Surg., 111: 775-819, (May) 1940.
7. Storck, Ambrose H.: Abdominal injuries: preventive and prophylactic aspects. Ann. Surg., 113:720-729, (May) 1941.
8. Storck, Ambrose H.: Gunshot wounds of the abdomen. Surg., Gynec. and Obst., 74:425-427, (Feb. 16) 1942.

SHOCK, ITS CAUSE AND TREATMENT

CHARLES E. REA, M.D.

Saint Paul, Minnesota

IT is easier to describe and treat shock than it is to define it. Shock is a symptom-complex characterized by weakness, pallor, rapid pulse, sweating, low blood pressure, and loss of degrees of consciousness. If progressive and untreated, it leads to death. Something happens that allows increased cellular permeability, hemo-concentration, reduced blood volume, reduced blood flow, with a resultant tissue anoxia and damage.

Shock may be either primary or secondary. Goltz described primary shock in 1865, which he showed to be a purely reflex mechanism, the sudden drop in blood pressure being due to a reflex vasodilatation. This type of shock occurs following the use of spinal anesthetics, in operations on the brain or spinal cord, from unpleasant sensory experiences, and in operations in which there is pulling on the mesentery or peritoneum. In most instances the shock is only temporary and responds to vasoconstricting drugs or to lowering the head of the patient as in the Trendelenburg position. Secondary shock is probably due to a combination of several factors and the initiating factor is still debatable. The time factor and the intensity of the shocking procedure are important in determining whether the shock is primary or secondary. Gross, in 1872, believed that the decrease in blood volume was important in secondary shock. This clinical observation has been supported by the work of Mann, Erlanger, Porter and others. Just how this reduction occurs has been the subject of much investigation.

Several investigators have supported the hypothesis of vasoconstriction as bringing about the reduction of blood volume. However, as Blalock has pointed out, no one has produced shock by causing uncomplicated vasoconstriction, and vasoconstriction is probably an accompanying and contributing factor rather than an irritating one in causing the reduction of blood volume.

Some have believed that a toxin liberated in the injured tissues causes capillary dilatation with an increase of permeability and subsequent loss of fluid. Cannon and Bayliss placed a tourniquet around a limb of a cat and then traumatized the muscles. The animal remained normal as long as the tourniquet was in place, but when it was

From the Department of Surgery, University of Minnesota Medical School, Minneapolis, Minnesota. Read in Symposium on Emergency Surgery before the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 1, 1942.

removed the animal rapidly went into shock. It was thought that a toxin was liberated from the damaged tissues which was taken up into the circulation when the tourniquet was removed which caused generalized capillary dilatation, increased permeability of the vessels, a generalized loss of fluid with a subsequent oligemia. This experimental work coincided with the clinical observations made during the first World War. It was noticed that soldiers brought into hospitals with a tourniquet on an injured extremity rapidly went into shock when the tourniquet was removed. Dale and Laidlaw showed there was a similarity between shock caused by the intravenous injection of histamine and traumatic shock.

Up to 1930, the idea that a toxin was the cause of shock was generally accepted. About this time, however, Blalock and Parsons and Phemister showed that in the cat-limb experiment of Cannon and Bayliss, enough fluid was lost locally into the thigh and pelvis as a result of the trauma to account for the decrease in blood volume. It was shown when the femoral artery was excluded from the tourniquet and the limb traumatized, the animal still went into shock even though there was no avenue of escape of the toxic products. Perfusion experiments with blood from traumatized regions have failed to elicit any evidence for the presence of vasodilator substances in the tissues. Numerous investigations have repeatedly shown that histamine is not the sole causative agent in traumatic shock. Dragstedt and Mead were unable to detect any histamine in the blood or lymph of animals dying of traumatic shock; yet when sufficient histamine had been given to cause death from histamine poisoning, this substance was easily detectable. Dale has shown that the shock that followed the Bayliss-Cannon limb-trauma experiment was not histamine poisoning.

There is a definite relation between the local loss of fluid and the reduction of the blood volume present in traumatic shock. Harkins has shown that the average amount of plasma that must be removed to produce death is 4 per cent of the body weight.

Nervous factors are important in the etiology of shock. It is well known that rough handling of tissues, unskillful manipulation, faulty immobilization of fractures, fatigue, cold, fear, and pain all increase shock. Crile believed that shock was due to excessive painful stimulation which brought about exhaustion of the vasomotor centers. Some of the best work of the problems of the nervous factors of shock was done by O'Shaughnessy and Slome of England. They found that the time it took for an animal to die following fracture and trauma of an extremity was not closely correlated with the amount of plasma lost. O'Shaughnessy felt that there was an important nervous factor in traumatic shock. In the critical experiment carried out by O'Shaughnessy, the hind leg of an animal was isolated, the circulation was cut off, but the nerve trunks remained intact. In order to maintain the irritability of the nerves the experimental animal was perfused by a second animal; therefore, when trauma resulted in shock, it could only be through nerve impulses. O'Shaughnessy's experiment has been successfully repeated by Kabat.

It might be thought that anesthesia should lessen or actually prevent shock due to nerve impulses; however, recent experiments have shown that nerve impulses actually reach the sensory cortex in general anesthesia. They do not reach the brain with local or spinal anesthesia. In shock due to trauma, the deeper the anesthetic the more severe the shock. An interesting experiment concerning the relationship of nervous impulses and fluid loss in shock is the following: If one determines how much blood an animal can lose before going into shock and then lets the animal recover; if a femur is fractured and the edges of the fractured bones rubbed together, the animal will go into shock when a much less quantity of blood has been lost. It is well known experimentally and clinically that if one injects local anesthesia at the side of the fracture, the incidence of shock is much lower.

From the above discussion, it is seen that the loss of blood volume and also nervous impulses play an important role in surgical shock. The nervous factor is especially important in some types of traumatic shock, as in the fracture of the long bones. Recently it has been shown that the effect of the afferent nerve impulses appear to be quite definite in intensifying fluid loss in burns.

Treatment of Shock

The best way to treat shock is to try to prevent it by getting the patient in the best possible condition for operation, care in the selection of anesthesia, avoiding trauma to the tissues during

the surgical procedure, etc. If the shock is primary in nature, as for instance after hearing some bad news, or immediately following the administration of a spinal anesthetic, etc., all that one has to do is to lower the head and wait a few minutes, and in cases of mild shock this is all that is necessary. In regard to spinal anesthesia, if a patient goes into severe shock, vasoconstricting drugs do not do much good. Vasoconstricting drugs, as ephedrine, are most effective when given at the time the anesthetic is administered. After the patient has gone into shock from a spinal anesthetic one usually has to give intravenous fluids to overcome the shock. Occasionally, one sees shock in patients brought back to the ward after an operation in which cyclopropane has been used. This is usually a temporary affair and the blood pressure quickly rises when the patient is put into Trendelenburg position.

The question as to when we consider a patient is in shock is best considered here. The best criterion is the blood pressure. Certainly when the systolic pressure registers 100 mm. of mercury the patient is imminently in danger of going into shock; when the pressure falls to 80 mm. of mercury the patient is definitely in shock and when it falls to 60 mm. or lower the patient's condition is critical. In treating shock it is important to try to get rid of the cause if possible, that is, stopping the source of bleeding, correcting improper splinting, etc. The patient should be kept quiet and warm, with the head lower than the rest of the body. Adequate amounts of sedation should be given, but most important of all the reduced circulating blood volume must be corrected. The intravenous administration of whole blood is the best treatment in case of shock due to hemorrhage; next best are blood plasma or serum. If these are not immediately available, an intravenous injection of a 5 per cent acacia solution or physiologic saline may be given temporarily.

One hears nowadays the term serum and plasma used interchangeably. While physiologically these substances are different, they have the same value where a safe, physiological solution of serum proteins is indicated. Plasma has the disadvantage of containing a fibrin veil which must be removed by filtration before use. The presence of unprecipitated fibrinogen is always a potential source of further fibrin-veil formation. Plasma also contains citrate and saline solutions which dilute the effective therapeutic agent and may in themselves cause reactions. Serum has none of these drawbacks and is rapidly gaining favor as an infusion fluid. This has been especially true in wartime England where the high incidence of bacterial contamination and the necessity of filtration has thrown the use of plasma into disfavor. It is especially urged that great care be taken in hospitals where plasma is redeemed as a by-product of a blood bank. In this instance, the lack of proper checks on sterility, the excessive hemoglobin content due to hemolysis, the absence of proper pooling, the increased potassium level due to hemolysis, and the dangers from improper filtration have already led to catastrophes (Dwan).

The question arises, "How much blood does one have to give to a patient in shock?" One has to give enough blood until the patient's blood pressure rises to over 100 mm. of mercury and his general condition is improved. On several occasions the continuous transfusion of more than four or five quarts of pooled Group 0 blood has been necessary to bring a patient out of severe shock. Plasma and serum of course have the advantage of not having to be cross-matched with the patient 's blood. At the present time, nearly all the larger hospitals have blood banks and commercial plasma or serum is available to all smaller hospitals. As to the use of drugs, most of them are of questionable value in the treatment of shock. Adrenalin, caffein, sodium benzoate, coramine, metrazol are poor substitutes for transfusion with blood or blood substitutes in severe shock. Cortical adrenal extract may be of some value in preventing shock in burns, but certainly its prophylactic use and its use in severe shock is of questionable value in most surgical operations. Concerning the changes of the hemoglobin level, erythrocyte count, the hematocrite reading, the plasma specific gravity, or the blood potassium, these are of value in determining that shock is present. However, the blood pressure gives the earliest, simplest, and most accurate indication of impending shock.

Definition of Shock

This heading should logically appear at the first of the paper but, as it has been said, it is easier to describe and treat shock than it is to define it. Harkins has summed up the present-day understanding of the physiology of shock by describing it as "progressive vasoconstrictive oli-

gemic anoxia." A simpler definition of shock is the following: Shock is a symptom-complex resulting from a decrease in the circulating blood volume essential for the maintenance of the proper functioning of the heart and higher nerve centers. This would seem to give a satisfactory physiological explanation of the condition without entering into the more controversial aspects. It emphasizes the importance of correcting the reduction of blood volume and blood flow in order to prevent resultant tissue anoxia and damage.

Summary

The shock may be defined as a symptom-complex caused by a reduction in the effective blood volume essential for the maintenance of the heart and higher centers. Clinically, it is characterized by pallor, weakness, sweating, loss of degrees of consciousness, low blood pressure, and a rapid pulse. The importance of nervous factors in the cause of shock as well as the decreased blood volume has been emphasized. The earliest and most important sign of impending shock is a falling blood pressure. The present-day methods of treatment of shock have been reviewed.

Bibliography

Two excellent reviews of the subject of shock are those by Root and Harkins, quoted below. The author has quoted extensively from their publications.

1. Blalock, Alfred: Principles of Surgical Care: Shock and Other Problems. Chap. 6, pp. 91-186. St. Louis: C. V. Mosby Company, 1940.
2. Cannon, W. B. VI. Some characteristics of shock induced by tissue injury. Great Britain Nat'l. Health Ins. Joint Committee Rep. 25-30; 27-32, (March 14), 1919.
3. Cannon, W. B.: A consideration of possible toxic and nervous factors in the production of traumatic shock. Ann. Surg., 100:704-713, (Oct.) 1934.
4. Dale, H. H., and Laidlaw, P. P.: Histamine shock. Jour. Physiol., 52:255-390, (March 25) 1919.
5. Harkins, H. N.: Recent advances in the study and management of traumatic shock. Surgery, 9:231-294 (Feb.); 446-482 (Mar.); 607-655 (Apr.) 1941.
6. Moon, V. H.: Shock and Related Capillary Phenomena. New York: Oxford University Press, 1938.
7. O'Shaughnessy, Laurence, and Slome, David: Etiology of traumatic shock. Brit. Jour. Surg., 22:589-618, (Jan.) 1935.
8. Parsons, Eloise, and Phemister, D. B.: Hæmorrhage and "shock" in traumatized limbs, an experimental study. Surg., Gynec. and Obst., 51:196-207, (Aug.) 1930.
9. Root, R. T.: Traumatic shock: a brief review of its etiology. Proc. Staff Meetings Mayo Clinic, 17:218, (April 8) 1942.

TREATMENT OF BURNS

N. LOGAN LEVEN, M.D.

Saint Paul, Minnesota

BURNS have always been a serious problem in civil life, but now the accidents of wartime have greatly increased their importance. In wartime, the treatment of burns presents a problem differing from that during peacetime. As Penfield stated, "What is needed, is not a council of perfection in the treatment of burns; what is needed is standardized simple methods which could be used by a man in a dressing station, who has five or fifty burns to treat at once, methods that can be used in hospitals that might have to treat hundreds of them."

Treatment of burns is a threefold problem: (1) general treatment of the patient; (2) local treatment of the burn; (3) reconstruction and preservation of function of the parts involved.

In determining the severity of a burn it is of first importance to estimate the body surface involved. This is best done by the method of Berkow[3] as follows:

	Per cent
1. Lower extremities including buttocks	38
Foot 1/6; leg 2/6; thigh 3/6	
2. Trunk	38
Anterior surface 20%	
Posterior surface 18%	
3. Upper extremities	18
Hand ¼; arm ¾	
4. Head	6

In children under twelve the proportions are varied as follows:

Trunk	40
Upper extremities	16
Head (subtract the age in years from twelve and add the result to the adult figure)	6
Lower extremities (subtract the age in years from twelve and subtract this figure from the adult figure)	38

There is a great difference in the reaction of individuals to burns so that any comparison of cases is difficult.

All burns covering more than one-tenth of the

Read in the Symposium on Emergency Surgery at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 30, 1942.

body surface should be considered serious and those covering more than one-third of the body surface are often fatal. Burns of the anterior thorax, abdomen, genitalia and perineum cause symptoms far out of proportion to the surface area involved.

It is often difficult and of no great importance to determine the depth of the burn on the initial inspection. Often a burn which appears to be largely first and second degree may, after a few days, show definite evidence of a deeper or third degree burn.

Since current reports indicate that 60 to 80 per cent of deaths from burns are due to secondary shock, herein lies the greatest opportunity to lower the mortality rate in these cases. Most delayed fatalities are due to sepsis.

If the patient is not near a place where definitive treatment can be carried out, the local first aid treatment should consist only of cutting away the clothing from the part involved and covering the burned area with a sterile dressing. As soon as the patient arrives at a place where treatment for shock can be carried out, this should be done. No local treatment should be started until adequate treatment of shock has been carried out. This consists of relief of pain by large doses of sedatives or morphine (½ grain in an adult), elevation of the foot of the bed and prevention of heat loss. Application of excessive external heat may increase the shock due to the opening up of peripheral vessels with a resultant diminution of availability of blood for vital centers. It has been clearly demonstrated that there is extensive local loss of fluids in burns. Experimentally, a burn of one-sixth of the body surface area can cause a fluid loss of 70 per cent of the total blood volume in twenty-four hours.[11] Over half the plasma loss may occur within one hour of the burn. There is a continued loss of plasma for some time after the burn and the local edema reaches its peak in about twenty-four hours. This fluid loss causes a hemoconcentration and thus increased viscosity of the blood, slowing of the circulation time, decreased oxygen carrying efficiency of the blood and tissue anoxemia, resulting in eventual respiratory and circulatory failure.

The amount of fluid loss from the circulating blood volume may be estimated by hematocrit study and, if possible, the plasma should be given quantitatively.

Harkins[5] has advocated giving 50 c.c of plasma for every per cent of the body surface affected by a deep (blistering) burn. The formula roughly gives the entire amount of plasma that will be necessary; this amount to be given, one-third the first two hours, one-third the next four hours and one-third the next six hours.

An alternative formula for estimating the amount of plasma required (Harkins[5]) is to administer 100 c.c. of plasma for every point the hematocrit reading exceeds the normal of 45.

Saline and dextrose may increase the perivascular edema by further washing out the plasma proteins which are required to keep such solutions in the vessels.[4]

Because of the abnormal capillary permeability in burn cases during the first two days, plasma transfusions may fail to maintain the plasma volume level. Adrenal cortical extract has been shown to decrease capillary permeability and should be given together with adequate plasma transfusions in these cases.[9] Five to 10 c.c. every six hours should be given to adults and a proportionate dose to children. Because of marked chloride retention occurring in these patients receiving adrenal cortical extract the administration of saline should be limited.

In severe burns administration of oxygen may be of value to combat the tissue anoxia as the result of slowed circulation time.[12]

No matter what the local treatment used in a burn case certain fundamental principles should be followed in all cases. At all times burns should be considered to be open surgical wounds and sterile technique is essential. Caps and masks and sterile gowns and gloves should be worn by those dressing burns, since contamination from the nose and mouth may readily convert a clean wound into a contaminated wound. Sterile bed linen should be used in all cases.

In all types of treatment preliminary débridement of the burn should be limited to opening of the blebs, removal of skin fragments, and gentle cleansing with cotton balls, soap and water, followed by thorough rinsing with saline. Vigorous scrubbing, necessitating anesthesia for its performance, is inadvisable. The trauma of such a procedure increases shock, and the possibility of increasing liver damage should always be considered in these cases.

Since the advent of sulfonamids, the local treatment of burns has been in a state of flux.

Tannic acid has been perhaps the most widely

used treatment during the past few years. It has been applied as a solution (5 to 20 per cent) in the form of sprays, packs or baths, and as a jelly or paste. It has been used in conjunction with 10 per cent silver nitrate to cause a more rapid tan and decrease infection. Several objections have been raised to this method.

1. It destroys epithelial cells that would be of value in the regeneration of epithelium over the burn and thus delays healing.
2. It should not be used on the hands because the constriction of the tan about the fingers may cause ischemic necrosis.
3. It is unsatisfactory on the face, axilla, groin and perineum.
4. In third degree burns skin grafting is delayed. Infection usually develops under the crust and the tan separates slowly or must be excised.

Gentian violet, 1 or 2 per cent as a spray, forms a thin eschar and reduces infection due to gram positive organisms.[1] Using the triple dye (gentian violet 2 per cent, brilliant green 1 per cent, and neutral acriflavin 0.75 per cent) the growth of both gram positive and gram negative organisms is reduced.

The sulfonamids have been used in the form of solutions, ointments, pastes and powders, and have been effective against infection. Three per cent sulfadiazine in a solution of 8 per cent triethanolamine used as a spray has given excellent results (Pickrell[8]). It forms a thin translucent eschar that is strong, pliable and elastic enough to permit motion. The treatment is particularly useful in burns of the face, since the solution can be used in and around the eyes with impunity. When using any sulfonamids on large burned areas, the blood sulfonamid level should be followed, because of the absorption from the surface of the burn.

The use of sulfathiazol and urea in ointment form offers considerable promise because it has been shown that the urea action rids the wound of necrotic tissue and sulfonamid inhibitors, allowing the sulfonamid component present to exert a maximum bacteriostatic action.[6,10]

The Koch method of treatment of burns, converting the open contaminated wound into a clean wound by thorough cleansing, then applying a pressure dressing over a layer of petrolatum gauze, has many advantages.[2] It places the part at rest, decreases further fluid loss, does not destroy remaining epithelial elements, and thus does not delay healing.

The National Research Council Committee on Burns[7] has advocated the use of 10 per cent tannic acid and 10 per cent silver nitrate in spray form after débridement of the wound. On the face, axilla, groin and perineum, ointments are recommended.

Reconstruction

Extensive burns of third degree always will require covering by skin-grafting to prevent scarring and contractures. Any granulation surface of more than two to three square inches should be grafted in order to hasten convalescence. There are still many cases of burns which are allowed to heal by granulation with its subsequent keloid and fibrous tissue formation. When third degree burns are about joints, marked limitation of function will result. In these cases, especially, early skin-grafting makes all the difference between success and failure. Early resurfacing of granulating surfaces shortens the period of convalescence, prevents functional incapacitation and disfiguring scars.

The surface in third degree burns should be prepared by the use of saline dressings and compression. A layer of sterile old linen is placed next to the denuded area to prevent pain in changing dressings. Over this is wrapped a wet gauze roll. This dressing is kept moist with saline and changed daily. When the surface is free from gross pus and the granulation base is firm —not too exuberant and watery—and is cherry red in color, the area should be covered by a large graft of intermediate thickness. Sulfonamid powder may be placed over the granulations before applying the graft to decrease the possibility of infection. This does not interfere with healing of the graft. The graft is held in place by the same type of wet dressing and is left undisturbed for four or five days. Any motion of the part grafted should be limited by suitable splinting.

A careful follow-up should be considered part of the treatment of every burn case. Contractures, which might be prevented by proper splinting, may develop. Keloid formation may be limited or reduced by subsequent x-ray therapy. Disabling cracks and fissures may develop in scars on the backs of the hands.[12,13]

Summary

1. Sixty to eighty per cent of deaths from burns are due to secondary shock.

2. Shock should be treated by: (a) plasma transfusions to correct hemoconcentration, (b) adrenal cortical extract to decrease capillary permeability, (c) oxygen to relieve tissue anoxia.

3. All burns must be considered to be open surgical wounds and treated using sterile technique.

4. Early resurfacing of granulating surfaces will shorten the convalescence and preserve function of the parts involved.

Bibliography

1. Aldrich, R. H.: Treatment of burns with a compound of aniline dyes. New England Jour. Med., 217:911-914, (Dec.) 1937.
2. Allen, H. S., and Koch, S. L.: The treatment of patients with severe burns. Surg., Gynec. and Obst., 74:914-924, (May) 1942.
3. Berkow, S. G.: Method of estimating extensiveness of lesions (burns and scalds) based on surface area proportions. Arch. Surg., 8:138-148, (Jan.) 1924.
4. Elkinton, J. R., Wolff, W. A., and Lee, W. E.: Plasma transfusion in the treatment of the fluid shift in severe burns. Ann. Surg., 112:150-157, (July) 1940.
5. Harkins, Henry N.: The Treatment of Burns. Springfield, Ill.: Chas. C. Thomas, 1942.
6. Holder, H. G., and MacKay, E. M.: Wound therapy with special reference to application of carbamide-sulfonamide mixtures to contaminated and infected wound. Military Surg., 90:509, (May) 1942.
7. National Research Council, Division of Medical Sciences; Treatment of burns. War Med., 2:334-339, (Mar.) 1942.
8. Pickrell, K. L.: A new treatment for burns: preliminary report. Bull. Johns Hopkins Hosp., 69:217-221, (Aug.) 1941.
9. Rhoads, J. E., Wolff, W. A., and Lee, W. E.: The use of adrenal cortical extract in the treatment of traumatic shock of burns. Ann. Surg., 113:955-965, (June) 1941.
10. Tsuchiya, H. M., Tenenberg, D. J., Clark, W. G., and Strakosch, E. A.: Antagonism of anti-sulfonamide effect of methionine and enhancement of bacteriostatic action of sulfonamide by urea. Proc. Soc. Exp. Biol. and Med., 50: 262, (June) 1942.
11. Underhill, F. P., Fisk, M. E., and Kapsinow, R.: The extent of edema fluid formation induced by a superficial burn, Am. Jour. Physiol., 95:325-329, (Nov.) 1930.
12. Wakeley, C. P. G.: The treatment of war burns. Surgery, 10:207-232, (Aug.) 1941.
13. Wakeley, C. P. G.: War burns and their treatment. Practitioner, 146:27-37, (Jan.) 1941.

MANAGEMENT OF FRACTURES UNDER WAR CONDITIONS

HARRY B. HALL, M.D.†

University of Minnesota

Minneapolis, Minnesota

THE majority of the patients herein considered suffered fractures from enemy action due to air raids. A few were injured while on mine sweepers or on boats in the harbor which struck mines, and also suffered from immersion shock as a result of being in water for a period of time. The problem of the management of the fractures will be considered in two phases. The first phase includes the care of the patient from the time of the injury to admission to the hospital, and the second phase concerns hospital treatment.

Care of the Patient Before Hospitalization

Most of the patients received injuries from falling buildings and suffered a fracture of an extremity either from flying debris or being buried under brick, stone, or timber. Some of the patients were buried for a period of four or five hours while others, of course, were buried for only a few minutes and some were merely struck by a flying object and knocked down.

As the patients were picked up by the stretcher-bearers they were hastily but carefully examined for any gross injuries such as compound fractures, dislocations, or large lacerations. Those patients who had severe fractures or dislocations were immediately splinted, placed on a stretcher and carried to a waiting ambulance. If there were any open wounds, sterile dressings were applied before application of the splint. As a rule, sulfanilamide was not dumped into the wound. The ambulance then conveyed the patient to a nearby casualty clearing station where preliminary care was given. Very few patients ever required the use of a tourniquet. The use of a tourniquet in war zones undergoing air raids is dangerous unless a trained person can remain with the patient. Many times ambulance trips are interrupted, and the patient may have a tourniquet on four or five hours instead of thirty or sixty minutes as was originally planned. Most hemorrhage can be stopped by direct pressure. Therefore, unless absolutely indicated, the application of a tourniquet is dangerous.

When the patient arrived at the casualty clearing station he was checked over by a physician and a note of his injuries was made and placed on a card which was suspended from the patient's neck by a string. Thus, a patient having suffered a fractured leg had this information

†Former member of the American Hospital in Britain at Basingstoke, England.

written on a card. This tabulation prevented a repetition of questioning and examining for both the patient and the doctor. At the casualty clearing station if the splints that had been applied were not adequate, they were re-applied. Blood plasma was given to patients in shock. Opiates were given for pain. Minor wounds were treated and sutured. Dressing were inspected, and the patients were made as comfortable as possible. After the examining physician had given preliminary treatment to the patient and it was safe to transport the patient to a hospital, this was done.

Many of the patients did not need to be sent to a hospital as they suffered only from minor abrasions and small lacerations which could be cared for at the casualty clearing stations. However, those patients who had major injuries, requiring operating room care, x-ray, or treatment, were immediately referred to a hospital.

Hospital Treatment

The patients would arrive at the hospital any time from an hour or two after the injury up to twelve to twenty-four hours after the injury. As the patients were admitted into the hospital they were again checked quickly to see whether any fracture or injury had been overlooked.

From the admitting rooms the patients were referred to different wards in the hospital, depending on the type of injury they had. Upon arrival at the ward the patients were under the immediate care of a ward surgeon who gave each patient a careful physical examination. All patients requiring antitetanus or antigas gangrene antitoxin were given these sera. If, after examination of the patient and evaluation of the x-rays, it was necessary to do further operative or manipulative work of the fracture, the patient was referred to the operating theater.

Compound fractures untreated up to twelve hours often had performed débridement and primary closure of the wound. It was demonstrated, even in the treatment of a large number of compound fractures, that a careful débridement is the all-important thing and sulfanilamide merely handles the minor potential infections that might be missed by a surgeon. The problem of débridement was discussed several times with Trueta and he again reiterated the fact that he believed that débridement is the all-important factor, plus adequate plaster fixation. He had a series of over 1,000 compound fractures in which débridement only was done and no sulfanilamide was implanted into the wounds. Only six of these patients succumbed to their injuries.

All fracture cases requiring skeletal fixation were treated in one of three ways:

1. The insertion of a wire or pin through a bone for traction.
2. Internal fixation by means of a plate.
3. External skeletal fixation by the Roger Anderson or Haynes apparatus.

If the fracture had been compounded, any of the above methods was applicable, but the Roger Anderson or Haynes technique was preferred by us. The closed plaster method also was used to promote healing of the soft tissues. One cannot emphasize too strongly that adequate fixation of the fracture is most important, both to the comfort of the patient and to the healing of the wound.

Early mobilization of the patient in a war zone is of great importance. A patient who can get to an air raid shelter by himself or who can be up and about himself is a much happier patient than one who has to lie in bed in a traction apparatus or a plaster cast. The Roger Anderson or Haynes external skeletal fixation apparatus was used on nearly sixty patients with great satisfaction. Patients with a fracture of the femur requiring some type of skeletal fixation were able to be up and about on crutches and many of them could bear some weight on their extremity. If this external skeletal fixation had not been used these patients would have been confined to bed in plaster casts or in traction apparatus. Not in one case was the use of these apparatuses regretted. In the majority of cases the patient was a much happier man and he could be up and about, helping himself instead of being a bed case requiring nursing care. These cases have been reported in a previous publication by Bradford and Wilson.

In the treatment of old fractures and infected fractures, again the Roger Anderson or the Haynes apparatus was used. Many cases of infected compound fractures can be reduced and held by the external skeletal fixation and yet have the closed plaster technique carried out. Each time the plaster has to be changed the patient does not have to be anesthetized, as the

procedure usually is a painless one, and with each change of plaster the fragments are not manipulated about and infection lighted up.

Many of the cases of badly infected compound fracture cleared up miraculously under the closed plaster technique. There was not one case in which the closed plaster technique had to be discontinued in favor of open dressings. In conjunction with the closed plaster technique the patient receives adequate dosages of either sulfanilamide or sulfathiazole by mouth. Sulfadiazene was not available at the time that this treatment was carried out. All infection was treated in the operating room and each time the plaster was changed sterile technique was carried out so as to prevent any possibility of re-infection of the wound. It reduces the chance of re-infection to once a month instead of once a day, besides being the most comfortable treatment for the patient. Nursing care was reduced to a minimum, and the patient instead of being helpless becomes helpful.

Summary

Wartime casualties resulting from air raids are similar to injuries caused by civilian accidents.

The treatment in many of the air raid casualties is similar to care of patients suffering from civilian injuries.

Many of the cases are seen later than they usually are seen in civilian practice.

Early mobilization of the patient in a war zone subjected to bombing is of great importance.

The Roger Anderson and the Haynes apparatus offer a safe and satisfactory method of mobolization of a patient with a fracture.

Sulfanilamide and sulfathiazole have proved to be of value but are not as important as a careful débridement and adequate fixation of a compound fracture.

EPISIOTOMY

Indications and Technique

JAMES J. SWENDSON, M.D.
Clinical Instructor in Obstetrics and Gynecology
University of Minnesota Medical School
Saint Paul, Minnesota

EPISIOTOMY has been called a nicety of obstetric practice. If visible or hidden perineal lacerations are to be avoided during parturition, it is more truly a necessity of good obstetrics in at least 90 per cent of primiparous labors and 60 per cent of all cases. One seldom regrets having done an episiotomy but one often regrets not having done one in cases where elasticity of the pelvic floor during delivery was seemingly but not actually sufficient to prevent lacerations.

An episiotomy is a clean cut of the vulvar ring away from the sphincter ani. Such an incision can be accurately repaired. It replaces a probable irregular laceration which would have been more difficult to repair and which might have involved the anus. A central or median incision is more properly called a perineotomy and unless the perineum is wide, its use invites extension through the anal sphincter. A true episiotomy is a mediolateral incision of the perineum and is oblique in direction. Lateral incisions which sever the more sensitive tissues of the labia majora have been largely abandoned.

The operation has become increasingly popular during the past twenty-five years. During that period many improvements in technique have been made which add to the satisfaction of both the doctor and the patient.

Maternal Indications

Indications for episiotomy may be either maternal or fetal.

Maternal indications make up the larger group. One might say that primiparity in itself is an indication for episiotomy since 90 per cent of primiparæ who do not have episiotomies done show more or less relaxation of the perineal tissues. Conversely, when episiotomy is done on primiparæ, the integrity of the soft parts usually remains as unimpaired as in the nulliparous state.

Read in a Symposium on Obstetrics at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 29, 1942.

The more absolute maternal indications for the operation would include congenital defects such as the narrow perineum of genital hypoplasia; the narrow arch of the android or funnel pelvis in which the fetal head encroaches more than usual on the posterior portion of the pelvic outlet; the rigid perineum of the elderly primipara; the scarred perineum resulting from a previous plastic operation; and the edematous vulva of the toxic patient.

Sometimes the rapid descent of the fetal head in a short, tempestuous labor, without crowning, necessitates an episiotomy.

The operation should always be done before a forceps delivery or before a breech extraction since lacerations are almost certain to occur.

Fetal Indications

In the case of breech extraction, the indication for episiotomy is fetal as well as maternal. The performance of a deep episiotomy may mean the difference between a living or a dead baby during extraction of the after-coming head.

Another fetal indication is concerned with the shortening of the second stage of labor for the protection of the fetus. Cerebral injury frequently results from prolonged use of the fetal head as a dilator of resistant perineal structures. The perineal stage of labor may be shortened by performing an episiotomy and following it by making pressure on the fundus of the uterus during contractions. Fundal pressure often successfully terminates labor. When it fails, outlet forceps may be applied more safely after an adequate episiotomy has been done.

The other important fetal indication is prematurity. Premature infants have wide sutures and soft skull bones which offer little protection for the poorly developed vascular system and the weak connective tissue supports of the brain. With such predisposition to intracranial damage, episiotomy often becomes indicated to prevent undue pressure.

Timing

The timing of episiotomy should be a matter of careful judgment. One should not wait until crowning is marked and probable tearing of muscle fibers has occurred. Rather one should make the incision soon after the head descends to the pelvic floor at a time when some stretching has occurred but before damage has been done. Ironing out of the perineum is usually a questionable procedure. It may be indicated before the episiotomy done preceding a midforceps operation or before a breech extraction when the presenting part is high. Often, however, it does exactly what we are trying to avoid, that is, it produces hidden lacerations which result in a lax pelvic floor.

Technique

General rules in the technique of episiotomy include consideration of the following points: (1) asepsis; (2) an adequate incision; (3) adequate control of bleeding; (4) the use of fine, absorbable sutures; (5) the prevention of undue suture tension; (6) the avoidance of dead tissue spaces; (7) the adequate exposure of the wound during repair; (8) the accurate approximation of tissue layers; (9) the avoidance of placing sutures through the rectum. Only a few pertinent details of these rules will be discussed.

Relative asepsis after cleansing the parts may be insured by placing a towel diagonally across the perineum and fastening its edge to the skin from beneath the towel with several Allis forceps.

The incision is best made diagonally from the middle of the fourchette and to the right. A right-sided episiotomy is easier to repair unless the operator is left-handed. It should be long enough and deep enough to prevent the occurrence of a laceration at either the vaginal or perineal end of the wound. Often incising the mucosa for an extra inch or more on the vaginal side will prevent irregular extensions of the incision.

Bleeding can often be controlled by means of pressure but usually it is necessary to use Kocher hemostats, taking rather generous bites of tissue to limit venous bleeding. The hemostats may be left on during the delivery and removed during the repair.

A considerable amount of blood can be lost from an oozing episiotomy wound and for this reason it is not advisable to make the incision too early or to delay delivery long after it has been made. If uterine contractions or pressure will not accomplish delivery promptly, low forceps extraction is indicated.

Local infiltration anesthesia with one per cent novocaine solution containing two or three drops of adrenalin to the ounce markedly reduces bleeding and this decrease in blood loss is one of the advantages of the procedure.

The use of absorbable sutures alone has largely replaced silk-worm and silk which were the ma-

terials formerly used for the en masse repair of lacerations by means of several interrupted through-and-through sutures. Painful tension sutures are rarely necessary. The chromic catgut used should be as fine as possible. No. 1 is strong enough and sometimes No. 0 is preferable.

A minimum of suture material should be used and as few square knots should be buried as possible. Yet it is better to use more catgut and avoid dead spaces in the approximated wound than to use too little. The markedly vascular perineum is remarkably tolerant of foreign material and will often heal under the most adverse circumstances.

Sutures should be tied neither too tightly nor include too large masses of tissue in each bite. Either error will result in painful healing and will invite breaking down of the repair.

Good exposure of the wound is an important point in doing a good layer repair. It is best accomplished by an assistant standing on the left side of the patient holding two right-angled retractors one under the symphysis and one to the left side. A Gelpi retractor placed at the two muco-cutaneous junctions of the wound when an assistant is not available may be spread to give good exposure. A vaginal pack helps to keep blood from obscuring the wound and one with a tape attached to it is less liable to be left in the vagina at the end of the repair than one without such a reminder.

Suturing, in my experience, is best done by starting at the upper and mucosal angle of the wound with a half-length suture, the first stitch encircling the deeper tissues and thus preventing a weak spot or pouching at this point in the vagina. After it is tied, it is carried down as a continuous suture to the hymenal ring, care being used to take longer bites on the medial side of the wound than on the lateral side, thus insuring symmetrical approximation at the mucocutaneous junction. This detail of the procedure is necessary because there are muscle fibers on the lateral side of the incision which retract and shorten the wound-edge while the medial side is relaxed and lengthened by being pulled down by the perineal body.

When the continuous mucosal suture has been carried down to the hymenal ring it is laid aside and left long for skin closure later. Interrupted sutures are now placed in the severed portions of the levator ani and the more superficial tissues.

Care must be taken to avoid placing sutures in the rectum which is much closer to the medial side of the wound than one would think. There are several alternative methods of preventing this accident. A sterilized test tube may be used as a rectal guide or, better still, an aluminum, sausage-shaped rectal guide made for the purpose, may be inserted during the repair. One-finger gloves which are made to slip over the forefinger of the gloved hand are also available. Sometimes an intrepid assistant will insert his gloved finger in the rectum while sutures adjacent to the bowel are being placed.

The repair is finished by uniting the superficial fascia beneath the skin with a continuous suture which is the same one used to unite the vaginal edges of the wound. The rest of this suture is then threaded on a fine, curved, cutting needle and is continued upward subcutaneously to finish the repair. One through-and-through stitch with this suture is placed at the hymenal ring and is tied. It is the only knot visible at the end of the closure.

Complications

Infection of the perineum occasionally will cause partial or complete separation of an episiotomy wound. When this complication occurs, cleansing of the wound two or three times a day with sterile water followed by the application of equal parts of sulfanilamide and sulfathiazole crystals in a spray will usually clean it up in three or four days. It then may be secondarily repaired under local infiltration anesthesia a day or two before the patient leaves the hospital. A few through-and-through, heavy dermal sutures are placed, tied, left long and all of the long ends are tied together. These sutures will be removed a week later when secondary healing has occurred. The procedure usually does not prolong a hospitalization period of ten days and the result is usually as good as in a wound healing by primary intention.

Another rarer complication of episiotomy is a hematoma of the perineum sometimes dissecting up into the broad ligament. Small hematomas absorb. Large ones may need to be incised and drained externally.

When routine rectal examination after the completion of episiotomy repair reveals a suture through the wall of the rectum, it is best to leave it alone if no narrowing of the lumen is palpable. Cutting of the suture may start troublesome

venous bleeding in the rectum. If, however, it seems advisable to cut the suture, it may be done with blunt-tipped scissors through the anus. It should not be pulled out after cutting but should be left *in situ*.

After Care

After-care of an episiotomy wound should be simple. Daily cleansing perineal douches are routine. A heat lamp directed on the perineum two or three times a day for fifteen or twenty-minute periods when the patient complains of discomfort is helpful. Application of one of the anesthetic ointments to the suture line once or twice a day reduces sensitiveness and irritation.

References

1. Berlind, M. M.: Episiotomy in prematurity as a prevention against cerebral hemorrhage. Med. Jour. and Rec., 135:180-182, (Feb. 17) 1932.
2. Diethelm, M. W.: Episiotomy: technique of repair. Ohio State Med. Jour., 34:1107-1110, (Oct.) 1938.
3. Hess, O. W.: The use of catgut in the perineum. Surg., Gynec., and Obst., 63:308-314, (Sept.) 1936.
4. Huff, G. D.: Mediolateral episiotomy. California and West. Med., 48:177-179, (March) 1938.
5. Kretzschmar, N. R., and Huber, C. P.: A study of 2,987 consecutive episiotomies. Am. Jour. Obst. and Gynec., 35:621-626, (April) 1938.
6. Mathieu, A.: Episiotomy. West. Jour. Surg., 40:330-336, (June) 1932.
7. Pieri, R. J.: The female perineum. Episiotomy and a technique for its repair. Jour. A.M.A., 110:1738-1743, (May 21) 1938.
8. Rosenfeld, S. S.: A rectal guide. Am. Jour. Obst. and Gynec., 35:713-714, (April) 1938.
9. Taylor, H. C., Jr.: Indications and technique of episiotomy. Am. Jour. Surg., 35:403-408, (Feb.) 1937.

SULFATHIAZOLE AS A GONORRHEA PREVENTIVE

Encouraging Results Obtained by Giving It By Mouth To An Experimental Group of 1,400 Soldiers Before Exposure

From results obtained in an experimental group of soldiers, sulfathiazole administered by mouth appears to be an effective preventive against gonorrhea and chancroid, Capt. James A. Loveless and Col. William Denton, Medical Corps, Army of the United States, declare in *The Journal of the American Medical Association* for March 13 in a preliminary report of their investigation.

"Its administration in this experimental group," the two men say, "has not been attended by serious reactions. Sufficient evidence has been obtained to justify further extensive study of this problem."

In the introduction to their report the two officers say that "Our purpose in this study is to determine whether the prophylactic administration of sulfathiazole prevents the development of gonorrhea. The existence of an inordinately high gonorrhea rate among certain troops makes the development of an easily administered chemical prophylaxis particularly important. The following incomplete experimental data are published as a preliminary report because of the encouraging results already achieved. . . ."

The test group in the study consisted of a company of approximately 1,400 Negroes and the control group of approximately 4,000 Negro troops from the same post. In summarizing their report the authors say that "A company of approximately 1,400 Negro troops was given sulfathiazole prophylaxis of 2 Gm. before leaving the fort on pass. Those taking station prophylaxis received no further drug. All others received 4 additional Gm., 2 on returning to the fort and 2 the next morning.

"In this company there has occurred a phenomenal disappearance of gonorrhea and chancroid. Excluding the 'failures' not under the influence of the drug at the time of exposure, the gonorrhea rate dropped to a level of 8 per thousand yearly as compared with 171 per thousand in the control group, and the chancroid rate dropped to 6 as compared with 52."

Commenting on their study the two men say that "It is recognized that this presentation is preliminary in nature. However, it is believed that sufficient evidence is presented to prove that sulfathiazole prophylaxis will prevent gonorrhea and chancroid. It is our opinion that, under certain conditions and in a final form yet to be developed, prophylactic sulfathiazole administration would produce a remarkable decline in gonorrhea and chancroid in the Army. It is admitted that certain dangers are involved in administering this drug, particularly on a large scale, and that the answer to certain questions has not yet been determined. In view of the magnitude of the venereal disease problem and its effect on man days, we believe that the risks are justified.

"This experiment is being continued in an effort to simplify the administration of the drug and to obtain further corroborative data. . . . Until such data are available the study is not being extended, nor is it felt advisable that such measures be made routine practice."

The authors point out that the cost of this prophylaxis has been about 10 cents per soldier monthly. In a footnote they point out that since the preparation of their report 20 soldiers in the test group were subsequently admitted to the Station Hospital for various illnesses. All of them had previously received sulfathiazole as a prophylaxis. All of this group received sulfathiazole as a part of the treatment for the illness for which they were admitted to the hospital and in the entire group the treatment response to the drug was satisfactory and there were no reactions.

CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL

A. J. Hertzog, M.D., and S. V. Lofsness, M.D.
Pathologists

Presentation of a Case
Case A-43-428

Dr. Arthur: This case is that of a fifty-seven-year-old white woman who was admitted to the medical service on October 16, 1942. She was first seen in this hospital in March, 1940, complaining of an ulcer of the left leg which had been present for fifteen months. A biopsy of the ulcer at this time showed only a chronic suppurative type of inflammation. She was treated with all types of conservative therapy, including packs and superficial x-ray. The ulcer continued to spread over the entire left lower leg. The patient was transferred to the surgical service. An amputation was done just above the condyles of the femur. The clinical impression was that the ulcer was due to a deep thrombophlebitis. On this admission she subsequently developed some pain in the right flank. A left nephrolithotomy was done with the removal of a stone. The patient was then transferred to Parkview Sanatorium, where she spent almost an entire year. She was again admitted to the hospital in April, 1941, because of purulent drainage from a tumor nodule on the right thigh. A biopsy of the skin nodule was done and diagnosed by the department of dermatology as mycosis fungoides. She was then followed in the outpatient department, complaining of chronic dermatitis on the left thigh. Her last admission to the hospital was in October, 1942, because of ulcerative lesions of the skin on the right leg. She said that about fifteen or seventeen of these lesions had formed on the right leg within the past six months.

Physical examination showed a normal temperature. The blood pressure was 132/78; the pulse was 80 and respiration 18. The left leg had been amputated just above the knee. There were many small pigmented areas over the calf of the right leg and on the right thigh. There was a punched-out ulcer on the medial aspect of the left thigh, with an indurated inflamed area surrounding it. The lungs and heart were reported negative. The liver was palpable just below the costal margin.

Serological studies were negative for syphilis. The hemoglobin was 86 per cent (Sahli). The leukocyte count was 6,800 with 75 per cent polymorphonuclear neutrophiles. There was no evidence of immaturity of the leukocytes. Unrinalysis was negative. An x-ray of her chest in October, 1942, was reported as normal.

She was given a course of superficial x-ray therapy for the ulcerative lesions on the lower extremities. These responded poorly. She subsequently developed some lesions on the back. After two months some of the lesions on the extremities healed but later recurred. In January, 1943, decreased breath sounds in the right lower chest, with dullness on percussion, was noted. She developed a cough, fever, and complained of pain on respiration. The clinical impression was pneumonia of the right lower lobe. Examination of the sputum showed type 17 pneumococci. She was given sulfathiazole and showed some improvement. However, one week later her temperature again became elevated, and she developed a persistent cough. There was a friction rub over the posterior chest. X-rays at this time showed a rounded mass in the right posterior chest with evidence of some hydrothorax. On February 24, a thoracentesis was done with the removal of approximately 50 c.c. of purulent fluid. Cultures were negative. Numerous subsequent thoracenteses were done and cultures were persistently negative for tubercle bacilli. On March 11 her temperature suddenly rose to 103 degrees, and she began to raise blood-tinged sputum. She complained of severe pain in the right side of her chest. She expired on March 14, 1943.

Dr. Hertzog: Dr. Stenstrom will now show the x-ray films.

Dr. Stenstrom: The first pictures of her chest in January, 1943, showed a density in the right lower lung, with some evidence of pleural effusion at the right base. The next examination showed a rather sharply demarcated density in the right cardiophrenic angle. The question arose as to whether we were dealing with a mediastinal effusion, an unusual leaflet of the diaphragm, or a neoplasm. A lateral film shows a dense area in the posterior portion of her chest. About this time Dr. Moosnick obtained purulent fluid from the chest, so a mediastinal empyema was our first consideration.

Intern: From what part of the chest was the purulent fluid obtained?

Dr. Petit: The aspiration was done posteriorly in the midscapular line through the 8th interspace.

Dr. Stenstrom: The findings are not those of a bronchogenic carcinoma, as the diaphragm is not elevated; the mediastinum is not displaced; and there are no signs of atelectasis, as one would expect in the case of a tumor occluding a bronchus.

Dr. Petit: There are a few things in this case which might be mentioned. Differential white blood counts on several occasions showed an eosinophilia as high as 15 per cent, and on other occasions of 5 to 8 per cent. About two days before she died, another chest tap was done, and about 10 c.c. of purulent material were obtained. A culture of this showed a hemolytic streptococcus.

STUDENT: Could there be a relationship between the skin lesions and the findings in her chest?

DR. HERTZOG: I was hoping someone would bring up this question. In the literature and older textbooks, one gets the impression that involvement of the internal organs in mycosis fungoides is rare. However, Lawrence Bergman (Arch. Path. 29:530-540, 1940) was able to find eighteen cases in the literature in which autopsies had been performed in mycosis fungoides; in sixteen of the eighteen cases, the internal organs were found involved. The organs most frequently found affected were the spleen, liver and lungs. Dr. Arthur will now give the autopsy findings:

DR. ARTHUR: There was an old amputation of the left leg. The skin lesions have already been described. The right pleural cavity contained about 1,000 c.c. of reddish brown fluid. The left cavity showed no fluid. The right lung weighed 1,120 grams. There was a large grayish-white tumor mass in the right lower lobe that surrounded the lower bronchus. The tumor appeared quite necrotic and had the gross appearance of a bronchogenic carcinoma. The upper lobe showed some congestion. The opposite lung weighed 340 grams and showed nothing of note other than edema. The heart was not remarkable. The spleen and liver grossly appeared normal. Enlarged lymph nodes were not found. The remaining organs showed nothing of note. Dr. Hertzog will demonstrate the microscopic sections of the organs.

DR. HERTZOG: This slide shows a section of the large tumor mass from the lung. The center is necrotic, as the cells grew too fast for the blood supply. However, at the periphery we can recognize cellular detail. The histologic picture is that of a malignant lymphoblastoma and not that of a bronchogenic carcinoma. You see considerable reticulum hyperplasia and many nucleated giant cells. In this particular area, a small bronchus is surrounded by tumor tissue, but the wall is not invaded. The histologic structure resembles Hodgkin's disease more than any other type of lymphoblastoma. A section of the opposite lung shows only bronchopneumonia. The next slide is a section of skin removed at autopsy. From this section alone we can say nothing other than that it shows collections of lymphocytes scattered in the corium beneath the epidermis. This section of the kidney shows a small area in the cortex that has the histologic structure of the large lung tumor. A section of the liver shows areas of reticulum hyperplasia, lymphocytes, and multinucleated giant cells around the portal spaces. This, too, resembles Hodgkin's disease. The spleen shows nothing of note, other than an occasional giant cell in the pulp. Possibly, if this patient had lived long enough, she would have developed lesions in the spleen resembling those in the lung and liver.

A diagnosis of mycosis fungoides in this case rests upon the clinical findings of the dermatologists, together with a skin biopsy and the autopsy findings of a malignant lymphoblastoma. According to modern writers, mycosis fungoides is a dermatologic disease having neoplastic characters and probably arising from the reticulo-endothelium. It was first described by Alibert in 1814. The name, mycosis fungoides, is a misnomer. Klemperer thinks the disease starts with a reactive proliferation of the reticulum on an inflammatory basis, and in the course of time this loses its balance and becomes neoplastic. Involvement of the internal organs at autopsy appears to be the rule rather than the exception. The findings are those of a malignant lymphoblastoma. Some cases may resemble lymphosarcoma. In other cases the findings, like this one, are those of Hodgkin's disease. Berman reported a case of mycosis fungoides from the Department of Pathology of the University of Minnesota in 1940, in which the autopsy findings were those of leukemic reticuloendotheliosis. If we called those cases that showed immaturity in the peripheral blood, leukemia, and cases similar to this one, Hodgkin's disease, we would be obliged to accept Symmer's view (Arch. Dermat. and Syph., 25:1, 1932) that mycosis fungoides does not exist. It seems to me that mycosis fungoides should be regarded as a clinical rather than a pathological entity. The picture of dermatitis, infiltration of the skin, tumor formation, and ulcerations of the skin, may be due to various members of the lymphoblastoma group. There is apparently no valid argument in defense of the specificity of the histologic picture of mycosis fungoides.

Anatomical Diagnosis: (1) Mycosis fungoides with involvement of skin, right lung and liver; (2) bronchopneumonia; (3) right hydrothorax.

LACK PEP? SOLDIERS CAN BLAME IT ON TROPICS

Soldiers and sailors in the tropics who, after serving there for a time, feel listless, low and pepless can blame it on the climate. Justification can be found in a report by Commander James L. McCartney, Medical Corps, U. S. Naval Reserve, to *War Medicine,* published under the auspices of the National Research Council and the American Medical Association.

Low blood pressure and a low basal metabolic rate are likely to develop sooner or later after residence in the tropics, Commander McCartney states, quoting reports from a number of physicians who have studied the problem. The metabolic rate is that at which energy interchanges in the body proceed. The basal metabolic rate is that for the energy of mere existence.

Low blood pressure affects many but not all persons in the tropics. It does not, however, appreciably affect those with high blood pressure. This lowering of the blood pressure resulting from life in the tropics without such other causes as debilitating tropical diseases like dysentery is due, according to one authority, to the following conditions:

Constant dilatation of the small blood vessels near the surface of the body.

Increased secretory function of the skin, such as sweating.

Visceral influences.

Constriction of the small superficial veins.

Variations in the volume and viscosity of the blood.

—*Science News Letter,* May 29, 1943.

FOOT FUNCTIONS FOLLOWING THE LOSS OF THE TARSAL NAVICULAR

ELMER C. PAULSON, M.D.

Elbow Lake, Minnesota

THE tarsal navicular bone constitutes a segment in the medial longitudinal arch of the foot. As such it serves to transmit a portion of the weight of the limb from the talus through the cuneiforms to the first three digits. By means of its articulations, posteriorly with the talus, laterally with the cuboid, and anteriorly with the cuneiforms, it contributes to the small amount of intrinsic motion of the tarsus. The tuberosity of the navicular, on its medial surface, is the insertion of the tibialis posterior muscle, an adductor of the foot. It is readily apparent that none of these functions is indispensable for a usable foot. This suggests the question: exactly what happens to the foot in case of loss of the navicular?

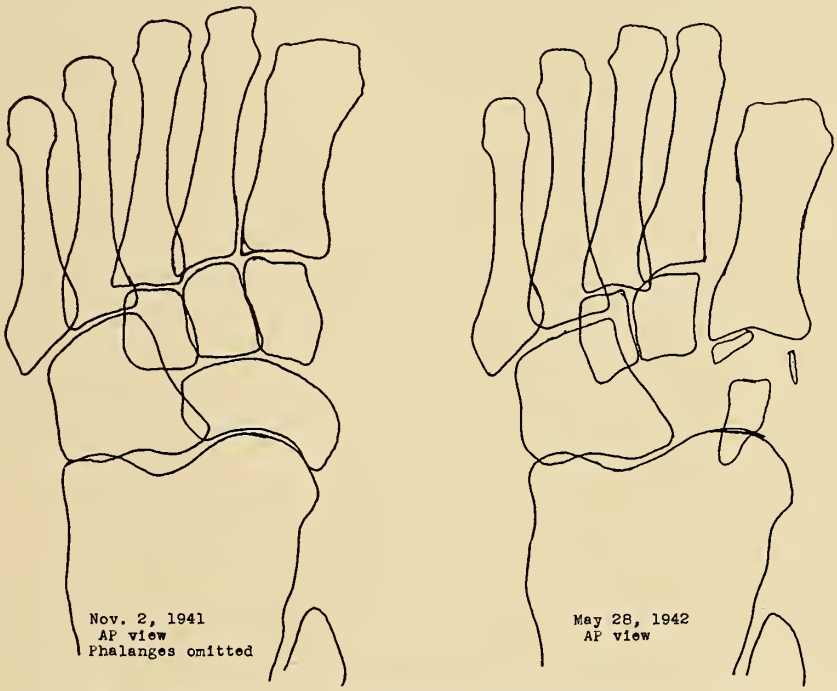


Fig. 1. Diagrams from roentgenograms, antero-posterior view, taken November 2, 1941 (phalanges omitted), and May 28, 1942.

A search of standard fracture textbooks and the Index Medicus for the last ten years was not particularly fruitful in finding an answer to this question. Scudder,[6] Böhler,[1] and Key and Conwell[5] do not mention the subject of removal or absence of the tarsal navicular. Kellogg Speed[7] states that in cases of fracture—dislocations of this bone in adults, "excision of the major fragment with or without fusion of the talocuboid joint" is the only satisfactory treatment. In the cases of adolescents with comminuted fractures, he also recommends excision of the bone subperiosteally and says that regeneration may "be awaited while the foot is kept at rest in inversion. Any new-formed bone fits the space perfectly and is protected during weight bearing by an arch support or adhesive tape strapping for several weeks."

Hauser[4] believes that where multiple fragments of the navicular are present, open operation and removal of the loose pieces should be done. Arthrodesis is recommended under certain conditions. Crossan,[2] in 1930, recommended removal of the navicular in compression fractures but did not state what happened to the foot after this was done.

Gorrell and Wilson,[3] in 1936, reviewed some of the recent literature on fracture of the navicular in which several authors favored removal of the bone in comminuted fractures. They stated further that it would be advisable to fill the bony defect with a bone graft.

This recommendation is based on three theoretical considerations:

"1. Because of the internal longitudinal arch being shortened and the external longitudinal arch remaining the same length, it is inevitable that the foot anterior to the astragalus would angulate medially, resulting in lateral strain on the calcaneo-cuboid and sub-astragaloid articulations.

"2. Removal of a portion of the arch shortens it in the vertical plane, and brings it closer to its base.

"3. The astragalus, being no longer supported anteriorly by the scaphoid, tends to rotate forward on the calcaneous. This process might continue to the point of changing the weight-bearing surface of the astragalus in the ankle joint."

The case to be presented in this article offers an interesting test of these three considerations.



Fig. 2. Photograph taken seven months after accident. Note shortening of right great toe.



Fig. 3. Medial view of foot in June, 1942, seven months after accident.



Fig. 4. Patient standing on tip toe, June, 1942.

Case Report

O. A., a sturdy young man of eighteen, weighing 190 pounds, was walking across a field on November 2, 1941, carrying a twelve gauge shotgun in his right hand. The gun accidentally discharged and the full load passed through his right foot. The muzzle of the gun was only about one and a half feet from his foot when it discharged. He was clothed in heavy overalls, heavy shoes and stockings, and portions of these were later found in the wound. A hunting companion applied a cloth tourniquet and there was apparently little immediate hemorrhage. The patient arrived at the hospital in good physical and emotional condition.

Examination of the right foot revealed a dorsal wound measuring about 5x3 centimeters of the navicular-cuneiform region. Opposite this, on the volar aspect, was another wound measuring 3x2 centimeters, where part of the charge had passed on through. The comparatively small size of these wounds was, of course, due to the extreme proximity of the gun at the time it was discharged. X-rays showed the presence of numerous shot and fragmentation of the navicular and first cuneiform.

Under ethylene-ether anesthetic a thorough débridement was done. The navicular and first cuneiform were so riddled with shot and felt wadding that it was considered necessary to remove them completely. After all devitalized tissue had been excised there remained a hole about 3 centimeters in diameter entirely through the foot. No attempt was made to remove shot which had recochetted into the healthy surrounding tissue. The wound was irrigated with two liters of saline, sprinkled with three grams of sulfanilamide, two soft rubber drains inserted through and through, and wrapped with bulky dry dressings. The patient was given a double prophylactic dose of combined gas bacillus-tetanus antitoxin.

He was given sulfathiazole by mouth for thirteen days postoperatively. During the first seven days there was considerable bloody drainage but no swelling or local sign of infection although his temperature rose to a maximum of 103°. During the following week the temperature gradually fell to normal and the drainage became serous. Dry dressings were used the first week and thereafter irrigations with epsom salt solution and chloramin-T were employed. On the thirteenth day he was given a transfusion of 350 c.c. of whole blood to boost his hemoglobin which had fallen to 60 per cent, Sahli.

He left the hospital on his thirteenth postoperative day, in good condition, with the instruction to soak the foot daily in epsom salt solution. The wound granulated out from the center, and in a month there remained only two superficial raw surfaces, one on the dorsum, the other on the medial volar aspect of the foot.

The patient was able to return to school with the aid of crutches on January 5. Epithelialization of the surface wounds was slow, and not complete until the end of March. The patient was permitted to wear a shoe as soon as bulky dressings were no longer necessary. He was given an arch support. By the middle of May he was able to walk very well with only a slight limp. At the time of this writing (July) he does all kinds of heavy farm work, walks with a barely perceptible limp, is able to rise on his tiptoes without difficulty and has no symptoms referable to his right leg or foot.

During the period of healing, it became evident that compensation for the two missing bones was taking place, not by a medial angulation of the foot, but by a posterior migration of the first metatarsal and phalanges. Roentgenograms of the foot taken in June, seven months after the injury, show that the great toe has been drawn backward two centimeters, so that the base of the first metatarsal is only two centimeters from articulating with the talus. The second and third cuneiforms lie in contact with the talus, but their respective metatarsals maintain their original positions. There is still a good longitudinal arch. There is no

evidence of rotation of the talus. The talo-cuboidal articulation and ligaments are apparently sufficient anchorage to compensate for loss of the supporting effect of the navicular.

Summary

A case is presented in which the tarsal navicular and first cuneiform were lost, due to a gunshot wound. After débridement, the foot healed satisfactorily, the gap caused by the missing bones being filled by a posterior migration of the first metatarsal and its phalanges. The end result is a well-functioning foot. The only deformity is a shortening of the great toe.

Bibliography

1. Böhler, Lorenz: Treatment of Fractures. Baltimore: Wm. Wood & Co., 1935.
2. Crossan, Edward T.: Fractures of tarsal scaphoid and of the os calcis. Surg. Clinics of N. Amer., 10:1477-1487, 1930.
3. Gorrell, Ralph L., and Wilson, Frederic L.: Tarsal scaphoid fractures and the subastragaloid joint. Minn. Med., 19:280-283, 1936.
4. Hauser, Emil D. W.: Diseases of the Foot. Philadelphia: W. B. Saunders Co., 1939.
5. Key, J. A., and Conwell, H. E.: Fractures, Dislocations, and Sprains. St. Louis: C. V. Mosby Co., 1937.
6. Scudder, Charles L.: Treatment of Fractures. Philadelphia: W. B. Saunders Co., 1926.
7. Speed, Kellogg: Textbook of Fractures and Dislocations. Philadelphia: Lea and Febiger, 1935.

PROTRUDED INTERVERTEBRAL DISC

CHARLES KOENIGSBERGER, M.D.
Mankato, Minnesota

The patient is an interior decorator, aged thirty-seven. The previous medical history is negligible.

Present Complaint.—Since the age of ten, the patient has had recurrent attacks of lower back pain. These have occurred at irregular intervals with a free period at one time of six or seven years. This periodic pain has been severe but not disabling. The pain has always been aggravated by coughing or sneezing. Between these episodes he has been entirely free of backache or other symptoms.

During June of this year, I saw this patient at his home. On the day previous he had been lifting a heavy radiator and felt a sudden pain in the lower back. He continued his work but with great difficulty on account of this severe lower backache. The next morning he got up and while dressing sneezed violently and was immediately conscious of a terrific pain down the distribution of the left sciatic nerve. He fell to the floor and when I arrived at his home he was writhing in pain. He was given ⅓ gr. of morphine intravenously and taken to the hospital. There he was put at rest in bed with local heat and appropriate sedation.

Air study on the next day disclosed a defect on the left side opposite the fourth lumbar interspace.

Physical Examination.—Disclosed a positive Lasègue sign, absent knee jerk and diminished Achilles reflex on the affected side. There was also tenderness on thumb pressure over the fourth lumbar interspace. Examination of the spinal fluid disclosed normal cytology; the total protein value was 183—normal about 25.

Hemilaminectomy on July 1 disclosed a protruded nucleus pulposus on the left side at the fourth lumbar interspace, pinching the nerve root against a greatly thickened ligamentum flavum.

Resection of this structure and removal by curette of the protrusion was accomplished. Convalescence was rapid and uneventful and after twelve days the patient was allowed to leave the hospital and will return to work three months after date of the operation.

Discussion.—The syndrome of protruded intervertebral disc has been generally recognized and understood, clinically and therapeutically for only about eight years. The lesion is a mechanical one. Some trauma or strain produces an injury to the cartilaginous shell of the intervertebral disc, allowing prolapse of the semisolid nucleus pulposus. The spinal nerve root which emerges from the intervertebral foramen is pinched between the herniated nucleus and the ligament flavum. This situation results in the symptom complex of lower back pain and sciatic neuritis. The disease is typically chronic and recurrent. The protruding nipple of tissue tends to become swollen and edematous as a result of minor strains or trauma. Following this, the patient experiences a more or less severe episode of lumbago and sciatic pain—usually and typically unilateral. A period of rest in bed encourages subsidence of the edema and swelling of the disc with temporary cure of the pain and disability. A repetition of the back strain brings on another episode. Finally the patient tires of the whole thing and seeks the permanent relief which surgery offers.

The symptoms of protruded intervertebral disc are therefore typically recurrent seizures of lumbar backache and unilateral sciatica. There is very characteristically marked accentuation of the pain on coughing or sneezing. On examination, the knee reflex and the Achilles reflex may be normal or diminished, or absent, on the affected side. Pain on raising the fully extended lower extremity is universally present in this condition. This is known as Lasègue's sign. The existence of the lesion may be confirmed and demonstrated by x-ray study after the injection into the subdural canal of a contrast medium such as iodized oil or air. A typical punched-out defect is noted opposite the protrusion.

The case I have reported is, I believe, unusual in view of the extreme severity and sudden onset of excruciating lumbar backache and sciatica following a history of recurrent lumbago without sciatic pain extending over a period of more than twenty years.

Read before the Southern Minnesota Medical Association, Rochester, Minnesota, September 28, 1942.

HISTORY OF MEDICINE IN DODGE COUNTY

BY JAMES ECKMAN
Rochester, Minnesota
and
CHARLES E. BIGELOW, M.D.
Dodge Center, Minnesota

(Continued from May issue)

The old Wasioja seminary, which has been mentioned previously, herein, attracted a homeopathic physician, **Dr. John Lewis Martin** (1808-1885), to Wasioja at some time in the seventies. He came from Frankford in Mower County, so that his children might be educated at the seminary at Wasioja, and he helped various Methodist clergymen or sometimes even substituted for them in the pulpit at Wasioja. He remained in that village until his death in 1885. Part of the time, it would seem, Doctor Martin was a minister, and he is known to have occupied the pulpit of the Wesleyan Methodist Church of Wasioja at various times in 1879 and 1880.[68]

It seems probable that **Dr. Chauncey Almer Kelsey** (1847-1918) settled in Concord in August of 1877.[69] He is known to have visited Kasson in that month with Doctor Higgins.[70] He had been graduated from the Chicago Medical College (Northwestern University) in 1875, and he stayed in Concord for only a short while. His son, Dr. C. G. Kelsey[71] of Hinckley, Minnesota, has reported that during the latter part of his father's life the elder man was interested chiefly in real estate and other endeavors, but examination of Dr. C. A. Kelsey's remarks at different sessions of the Minnesota State Medical Association, as reproduced in the *Transactions* of that organization, show that he was keenly interested in the practice of medicine. He practiced in the Territory of Dakota and in Illinois, Colorado, California and other places before he died. He became a member of the Minnesota State Medical Society on June 23, 1899, at the thirty-first annual session of that body in Minneapolis, and at the time he was living in Minneapolis. The secretary[72] of the South Dakota State Board of Health has not been able to discover that Doctor Kelsey was licensed to practice medicine in the Territory of Dakota, and records[73] of the State of Illinois would indicate that he was never licensed in that state.

In the summer of 1878 mention was made of **Dr. Charles S. Beaulieu** of Concord, thus establishing the fact that he had been there for ten years. Woods[13] and Moreland[67] said that Doctor Beaulieu married a young widow, Mrs. Lena Green Slocum,* a native of Vermont[75] reared in Dodge County. Doctor Beaulieu, a veteran of the War of the Rebellion, is known to have been called to Brownsdale in Mower County in November of 1880 as pastor of the Christian

*Widow of Dr. Julius Franklin Slocum (1843-1874), who had come to Mantorville with his parents in 1853, and who died in Marion in Olmsted County on November 9, 1874.

Church in that town.[75] He also practiced medicine there. By 1895 he was living in the village of New Haven, Missouri.[40] He was never licensed to practice medicine in Missouri,[76] nor does it appear that he had the desire to do so. Instead, he preached in the Christian Church in New Haven. Grannemann[77] reported that residents of New Haven had never been aware that Doctor Beaulieu was a physician. It is known that Doctor Beaulieu had been educated for the Roman Catholic priesthood,[75] and that at some time early in his life he had been converted to Protestantism. Hence, the report of Grannemann[77] would seem to be correct; but why Doctor Beaulieu ceased to practice medicine after he left Minnesota is a question the authors cannot answer on the basis of data at hand.

In the summer of 1878, it was noted,[78] **Dr. D. B. Geil** of Pine Island moved his "Turkish Bath and Vapor Institute" to Mantorville in Dodge County, and he opened it for business in November.[79] In July, however, **Dr. John Flood** (1850-1918) had located at Mantorville, and in the fall he converted an old school building into a "Hygienic Institute" of his own. A steam engine and vat for his institute arrived in Mantorville in the latter part of September. In December of that year Doctor Geil removed to Kasson.[80] He had previously offered to move to Kasson if the citizens of that town would present him with $100.00;[81] whether this sum actually was paid to him or whether Doctor Flood's competition was too keen is not known. Late in 1879 Doctor Geil moved to Wabasha with his "institute," and it is believed that the steam boiler of his apparatus subsequently exploded, scalding him severely if indeed not fatally.

Still another physician came to Dodge County in August of 1878. He was **Dr. Francis Alfred Comfort** (1841-1915), a Canadian, "of some twelve years' experience."[82] He was in Concord for only a short period, and never was licensed to practice medicine in Minnesota.[40]

At some time in 1878 **Dr. Nils Schultz Holterman** (1845-1895) of Kasson left the county to settle in what was then the new railway town of Glenwood. There he lived for the rest of his life. Very little is known about his professional career while he was a resident of Kasson.

It is interesting to note that necropsy was carried out in Dodge County in September of 1878. It was performed by Doctor Flood, and he was assisted by Doctor Garver, Doctor Ranson and Dr. John Lewis Martin.[83] Observations made at the time are not available to the authors.

Dr. Howard M. Sargent (?-1890) of Sullivan, Illinois, came to Concord while Dr. Charles Severin Beaulieu (1835-1896) was still there. Doctor Sargent was a former partner of **Dr. Solomon Blood** (1810-1881) of Owatonna. He settled in Concord in December of 1878,[81] and stayed there for several years. He had been graduated from the old Missouri Medical College of Saint Louis on March 2, 1877,[73] and had been licensed in Illinois in the same year.[73] He was coroner of Dodge County in 1880, and secretary of the Dodge County Medical Society in 1881. He was last mentioned in Dodge County newspapers in 1883.[84] In July of 1890 his widow visited friends in Concord, and it was observed at the time that Doctor Sargent had died in Illinois during the spring of that year.[49]

Some physician in Dodge County (probably Doctor Garver of Dodge Center) contributed the following sketch[85] of Dodge Center to the Minnesota State Board of Health and Vital Statistics in 1879:

DODGE CENTER

We are at this point on the Winona & St. Peter R.R. in a rich prairie and comparatively level country. This is the highest general surface on the line of this road between the Mississippi and the Minnesota rivers, this region forming the divide between the valleys of the two rivers. Diphtheria has never prevailed here. There have been only a few sporadic cases in the last seven or eight years.

Doctor Ranson and Doctor Garver of Dodge Center, Doctor Sargent of Concord, and Doctor Porter and Doctor Woodard of Claremont, coöperated to report in that year (1879) that the population of the county was 11,413.[86] There had been 118 deaths in the county during the year, of which six were caused by diphtheria.[86] A report[86] of the public health of Claremont was presented:

CLAREMONT, 1879.—For five or six years previous to report made in autumn of 1879, only sporadic cases of diphtheria had occurred in this vicinity. Dodge county has been singularly free of any important prevalence of the disease. Reporter gives a case of malignant diphtheria beginning at a place a few miles distant, within the sphere of a severe epidemic, moved to a non-infected locality near Claremont, proved fatal, and two mild cases resulted in the same house. The hygienic surroundings were good, the public was excluded, disinfectants were used. No further extension of the disease occurred.

1880.—Diphtheria prevailed as an epidemic in April. Of fifteen cases in the vicinity, two were Germans, three Americans, nine Irish and one Scotch—only three deaths. In all except two of the families the sanitary conditions were bad, the houses close, poorly ventilated and filthy. Decaying manure was found in close proximity to wells. This was especially noticeable in the families in which fatal cases occurred.

The deep concern with which diphtheria was viewed in the seventies, in the state at large as well as in Dodge County, was related in part to the fact that although it was recognized as being a "zymotic" disease, the degree of infectiousness was understood by very few physicians. The status of knowledge of diphtheria in the late seventies was touched upon by the Minnesota State Board of Health and Vital Statistics[87] in 1879 or 1880:

The State Board of Health have for the last five years used every endeavor to convince the medical profession and the people of our State that diphtheria was as infectious as smallpox in its behavior during the late epidemics. It is only within two years that the State Medical Society or the American Public Health Association have gone on record in favor of this view. In both societies the resolution was moved by a member* of the Minnesota State Board of Health.

The Doctor Woodard referred to herein a few paragraphs previously was **Dr. Francis Reuben Woodard** (1848-1926), who had settled in Claremont in 1879. Doctor Woodard, who had been reared in Rochester in Olmsted County, remained in Claremont for only about two years. He went to Minneapolis in 1881.

Dr. L. E. Hazen was a resident of Dodge Center at some time in the late seventies. He soon moved to Lowville in Lewis County, New York; the secretary[88] of the New York State Board of Medical Examiners has not been able to trace him further.

The Era of Stabilization, 1880-1890

During the eighties medical practice in Dodge County was in the process of stabilization. Roads were being extended and improved, the railway system

*Dr. Charles Nathaniel Hewitt (1835-1910) of Red Wing, was secretary and executive officer of the Minnesota State Board of Health and Vital Statistics from its foundation in 1872 until his own dismissal from the position in 1897. He was one of the greatest Minnesotans of his era. Folwell, who called him the "Apostle of Public Health," should be consulted (Folwell, W. W.: A History of Minnesota, Saint Paul, Minnesota Historical Society, 1930, vol. 4, pp. 413-425).

was almost complete (but not wholly, as will be shown), and village and township government was orderly and firmly established. The concept that the state should exercise some sort of concern in the health of the people, despite the fact that this concept was less than ten years old in 1880, had been validated in Minnesota by the creation of the Minnesota State Board of Health and Vital Statistics in 1872,* and affirmed by the mutually valuable relationship of county, city and township health officers to that board.

So far as the practice of medicine is concerned, the frontier vanishes from a community when (1) a unified and effective system of regulation of physicians and their activities is created, and (2) when institutions devoted to medical education arise. The first suggests that a scheme of control has evolved which, theoretically at least, will buttress the honest practitioner, dismay the quack and protect the patient; the second implies that there are in the community in question enough physicians sufficiently skilled in their profession to warrant their instruction of students of medicine.

Preparatory schools of medicine had existed in Minnesota prior to 1880, as several writers have demonstrated.[89,90] There was one in Saint Paul as early as 1871[89] and another in Winona in 1872.[90] But in the eighties the development of accredited medical schools in Minnesota empowered to confer the degree of Doctor of Medicine is impressive. The Minnesota College Hospital, founded in Minneapolis in emulation of the old Long Island College Hospital of Brooklyn, was opened in 1881;[91,92] the University of Minnesota Department of Medicine, which offered no courses and conducted no instruction in medicine, was projected in 1882 and founded in 1883;[90] the Minneapolis College of Physicians and Surgeons, which became the medical department of Hamline University in 1895, was opened in October of 1883[93] (but did not confer the degree of Doctor of Medicine upon its graduates); the Saint Paul Medical College, representing a resurgence of the preparatory school previously mentioned, opened in 1885;[89] the Minnesota Homeopathic Medical College was opened at Minneapolis in the fall of 1886.[94]

Another event of paramount interest to students of the history of medicine in Minnesota in the eighties was the passage of the first permanent law of licensure. This was the so-called Diploma Law of 1883.[95] It was the first permanent licensing law in medicine in Minnesota. A crude and unsatisfactory law had been enacted in 1869,[96] but had been promptly repealed in 1870.[97] The *Act to Regulate the Practice of Medicine in the State of Minnesota*[95] of 1883, the "Diploma Law," provided in part that "The faculty of the medical department of the University of Minnesota shall organize as a board of examiners. . . ."[95] This was the faculty of medicine previously referred to herein;[90] it acted as a board of medical examiners and could confer the degree of Bachelor of Medicine or Doctor of Medicine to candidates who could pass its examinations, but did no teaching in medicine. Men who completed the course at the old Minneapolis College of Physicians and Surgeons, for instance, could apply for examination by the University of Minnesota Department of Medicine. If they passed this examination they were awarded the degree of Bachelor of Medicine; if, further, they presented a thesis and defended it satisfactorily, they received the degree of Doctor of Medicine.[90] It is by means of the "Diploma Law" of 1883 and the law passed in 1887 which created an independ-

*It is believed that when the Minnesota State Board of Health and Vital Statistics was established in 1872, it was the third such agency to come into being in the United States, being antedated only by the board of health of the State of Massachusetts and that of the State of California.

ent state board of medical examiners†[98] (and repealed the "Diploma Law" of 1883) that the activities of physicians residing in Minnesota after 1883 can be traced, for even if a physician had been practicing medicine in the state for five years prior to 1883, and had thus gained exemption from the provisions of the act, his name was nevertheless recorded officially, and he received a certificate of exemption or a license.

The development of local medical colleges and the passage of the medical practice act of 1883 affected medicine in Dodge County as it affected medicine everywhere else in the state. The licensing law tended to drive quacks and irregular physicians from the state; the medical colleges soon sent physicians to the county who had been born, reared and educated within the state. The graduate of the eastern medical college was no longer supreme in Minnesota; under the medical practice act of 1883 the physician who had been graduated from a medical college in Minneapolis or Saint Paul was the equal of a graduate of the medical schools of Harvard, Yale, Edinburgh, Berlin, Vienna or anywhere else.

Dr. Frank Henry Garver (1857-1881), son of Dr. James A. Garver of Dodge Center, was in Dodge Center for at least a few weeks after February of 1880. He had been graduated in that month from the Butler University Medical Department of Indianapolis (organized in 1878 as the Medical College of Indiana). A little more than a year later he was dead.

It is possible that a woman physician, **Dr. Z. E. Watkins**, was in Mantorville for a short time in 1881. She issued a card on which it was announced that she treated chronic diseases by means of electricity. Nothing more is known of her, but she may have been an itinerant practitioner.

Dr. Charles Sumner Bigelow (1845-1931) settled in Claremont in November of 1881 to take the practice of Dr. Francis R. Woodard (1848-1926), who had decided to move to Minneapolis. Doctor Bigelow, a graduate of the University of Michigan Department of Medicine and Surgery, remained in Claremont until 1884, in which year he removed to Kansas. He came back to Dodge County in 1890.

In January of 1882 the *Dodge County Republican*[99] of Kasson announced that **Dr. J. Clark Bliss** (1846- ?), "who received a handsome fee for attending our late president" [Garfield?], had settled in Mantorville, to assume the practice of Doctor Flood, who was returning to Chicago. Dr. J. C. Bliss had been graduated from the old Cincinnati College of Medicine and Surgery on June 2, 1875; but whatever else might be said about him, it is certain that he did not attend President James Abram Garfield (1831-1881), for the Doctor Bliss who did was Dr. D. Willard Bliss (1825-1889) of Washington, D. C., as is made clear by several reports[101,102,103] of the stricken President's condition which that physician made. It was said[104] that Dr. D. Willard Bliss received a fee of $25,000 for his services to the dying President.

It is believed that Dr. J. Clark Bliss came from Wisconsin, for he returned to that state in February of 1882 to bring his family and his racing horses to Mantorville.[105] When he finally left Dodge County he was said[106] to have gone back to Wisconsin.

Dr. John Flood did not go to Chicago in 1882; instead, he accepted Doctor Bliss as a partner, and the two men pooled their race horses. While he was in Mantorville Doctor Bliss was elected to membership in the Dodge County Medi-

†It is interesting, although not particularly pertinent, to observe that homeopathic physicians succeeded in obtaining a proviso in this law to the effect that two members of the board must be homeopathic practitioners. Another interesting feature of the law was the fact that no member of the faculty of any medical college in the state could be appointed to the board.

cal Society, and he attended the thirty-third annual session of the American Medical Association at Saint Paul on June 6, 7, 8 and 9, 1882, as one of the delegates of the Dodge County Medical Society. In January of 1883 Doctor Bliss moved to Claremont in Dodge County.[107] He was interested in Dakota land and occasionally made trips to Dakota. He was licenced to practice medicine in that territory on February 18, 1886.[100] At the time he was listed as being a resident of what is now Raymond, in Clark County, South Dakota. He was never licensed to practice medicine in Minnesota.[40]

In 1896 Doctor Bliss was living in Lake Mills, Wisconsin.[109] When he received a license to practice medicine in Wisconsin on October 17, 1900, he was still living in Lake Mills.[110] The daughter[111] of Doctor Flood could remember the physician who had once been the partner of her father in Mantorville, but she could not remember what happened to him after he left Minnesota. The authors have not been able to discover additional data concerning this physician.

In the early part of 1882, Doctor Gibson, who had been in partnership with Doctor Garver at Dodge Center, moved to a farm near Fairpoint in Goodhue County. He returned to Dodge County in the fall of that year, to settle in Concord, where he was to remain until 1889, with the exception of a short visit to Colorado.

In February of 1882 it was said[112] that Dr. Horace P. Porter of Claremont would sell his drug store and move to Missouri; in March his goods were put up for sale,[113] and shortly thereafter Doctor Porter went to Corning, Missouri. It was noted[114] in November of 1882 that Doctor Porter had returned to Dodge County to visit his brother in Kasson, and it was said that he planned to relocate in Dodge County. In February of 1883, however, he was living in Nebraska,[115] probably in Richardson County or Pawnee County, near the Kansas boundary.

The year 1883 was scarcely under way before **Dr. James McLaughlin** of Mantorville died. A prominent Republican, he was serving in the Minnesota State Senate in Saint Paul when he fell a victim to pneumonia, and this condition, complicated by renal insufficiency of many years' duration, overcame him. He died at the Sherman House in Saint Paul on February 22, 1883[116] at the age of sixty-seven years.

In April of 1883 **Dr. Frederick L. Riser** (1858-1939) opened an office in Kasson,[117] but in August of the same year he went to Lansing, Iowa.[118] There is some evidence that he had been in Kasson in 1877. In neither 1877 nor 1883 did he have the degree of Doctor of Medicine. He did not obtain it until 1884. Possibly the aforementioned "Diploma Law" of 1883 induced him to leave Minnesota in the summer of 1883; at least, he was never licensed to practice medicine in Minnesota.[40]

A **Doctor Wilkins** of Wheaton, Illinois, was said to be "having good success in this vicinity" in a Concord news item in the *Kasson Vindicator*[118] in August of 1883. In the *Kasson Vindicator* for August 30, 1883, a **Doctor Cole** of Mantorville complained of an article that had appeared in a previous issue of that newspaper, but it is not known who he was.

The name of **Dr. Carlos R. Keyes** (1856-1938) a native of Vermont, appeared in the *Kasson Vindicator* during 1883. He was the Byron correspondent of that newspaper, and occasionally his professional notice appeared in the *Vindicator*. He may very well have practiced in Dodge County, but he never lived there. He resided in Byron in Olmsted County until 1891, when he moved to West Duluth.

In a Claremont news item in the *Kasson Vindicator*[119] in September of 1883 it was said that **Dr. Osmon F. Way** (1858-1936) would put in a stock of

drugs in one side of "Nelson's store" in that town. Doctor Way had come from Blooming Prairie in Steele County where he had opened an office after attending lectures at the State University of Iowa College of Medicine. He was a native of Dodge County, and he remained in Claremont for the rest of his life. He did not obtain the degree of Doctor of Medicine until 1891, although he had been licensed to practice medicine in Minnesota on December 31, 1883.[40]

In May of 1884 it was announced that **Dr. William H. Parker** (1859-1913), a native of Iowa, would move from Fairmont in Martin County to Kasson in Dodge County. Instead, he became the partner of Dr. James A. Garver at Dodge Center. He was only twenty-five years old at the time, and had been graduated from the State University of Iowa College of Medicine only about a year previously. Doctor Parker remained in Dodge Center, with Doctor Garver, until about 1887.

In September of 1884 **Dr. H. P. Porter** returned to Kasson from Shubert, Nebraska, to visit his brother.[121] About a month later, it was said that he had obtained a new stock of drugs, and that he would open a pharmacy and practice medicine in Claremont.[122] There is, in fact, ample evidence that Doctor Porter was practicing medicine in Claremont in the fall of 1884, for it is recorded that in November of that year Doctor Porter and Doctor Ranson of Dodge Center brought to **Dr. William W. Mayo** (1819-1911) and his son, **Doctor William J. Mayo** (1861-1939), of Rochester, a patient who had sustained a traumatic stricture of the urethra. The operation by the two Mayos, father and son, evidently was a success. "The after treatment was carefully managed by Doctors Ranson and Porter," the Rochester surgeons reported,[123] "and at last accounts he [the patient] was entirely recovered; urine passing naturally." The operation is of interest because it was one of the first in which Dr. William J. Mayo participated. The date of his graduation as inscribed on his diploma from the University of Michigan Department of Medicine and Surgery is June 23, 1883, but he was in the East for some time after that.

As for Doctor Porter he remained at Claremont until 1886, when he traded his stock of drugs for Kansas land which **Dr. Charles W. Coleman** (1855-1925) owned.[124] Doctor Porter then moved to Kansas with his family,[125] and never again located in Dodge County. It has not been possible to determine his professional activities or his precise movements in Kansas because, as the secretary[126] of the Kansas State Board of Medical Registration and Examination has pointed out, the records of his board do not extend back beyond the year 1901.

At about the time (1884) Doctor Porter was thinking of moving to Claremont, as set forth previously, Doctor Bigelow of Claremont had decided to move to Kansas. In October of 1884 he moved to that state, where he settled in Cloud County. Doctor Porter then took over Doctor Bigelow's practice at Claremont.

During the eighties in Minnesota, and particularly in the years before the Medical Practice Act of 1883 became law, itinerant quacks were common. They infested cities perhaps more than small towns, but many of them soon learned that by visiting certain villages, remaining there for a few days and reaping the harvest of lurid advertisements of their thaumaturgic powers which they had inserted in village newspapers a few days before they actually arrived, they could gain a relatively handsome livelihood. There was no sort of legislation to deter them, and railway facilities were fairly good.

One of these traveling quacks was **Dr. Edward N. Fishblatt** (? -1898), of New Jersey, New York, Chicago and Janesville, Wisconsin. In 1883 and 1884 he was conducting a "Medical & Surgical Institute" at Janesville, but he

also made extensive forays into Minnesota and the Territory of Dakota. He paid for several garish advertisements of his prowess in the *Dodge County Republican,* of Kasson, and excerpts from one of these advertisements, as published in that newspaper on February 28, 1884, will demonstrate his agility in rhetoric.

He claimed to be:

Late Lecturer and Professor in one of the medical colleges in the United States, editor of the New York Medical and Surgical Journal, consulting physician and operative surgeon in the New York Hospital for Chronic diseases.

He said that he:

On account of his Immense Practice in the Western States Has Established a large Medical and Surgical Institute at Janesville, Wisconsin, for the treatment of Chronic Diseases as well as the Diseases of the Nervous System, Heart, Liver, Stomach, and Blood.

He was not unskilled in the literature of terror:

Immediately cured and full vigor restored. This affliction which renders life a burden and marriage impossible, is the penalty paid by the victim of improper indulgence. Young persons are apt to commit excesses from not being aware of the dreadful consequences that may ensue. Now who that understands this subject will deny that procreation is lost sooner by those falling into improper habits than by the prudent? Besides being deprived of the pleasures of healthy offspring the most serious and DESTRUCTIVE symptoms of both mind and body arise. The system becomes deranged, the physical and mental functions weakened, loss of procreative power, nervous irritability, constitutional debility, wasting of the frame, cough, consumption and death.

SPECIAL NOTICE

Those who reside at a distance desiring the Doctor's service, and cannot call, will receive prompt attention through the mails by writing, stating symptoms, etc., enclosing stamp, when a printed list of questions will be sent.

Address,

DR. FISHBLATT, Medical Dispensary,
Janesville, Wis.

Doctor Fishblatt much later moved to Minneapolis, where he issued such journals as the *Minnesota Medical and Surgical Journal* and the *Northwestern Medical Journal,* as has been shown elsewhere.[127] The editor of the *Dodge County Republican* of Kasson observed in the issue for October 6, 1887, that: "Dr. Fishblatt, the Jewish quack, which visited our village in 1884, has now joined the Salvation Army, where his talents will be better appreciated." There is some doubt as to Dr. Fishblatt's conversion to righteousness in 1887, however, for it is recorded that on August 1, 1887, he was debarred from the practice of medicine in the Territory of Dakota "for gross unprofessional conduct, advertising and quack methods."[100]

(To be continued in July issue)

Editorial

Carl B. Drake, M.D., *Editor;* George Earl, M.D., Henry L. Ulrich, M.D., *Associate Editors*

STATE MEETING IN RETROSPECT

THE ninetieth annual session of the Minnesota State Medical Association held in Minneapolis last month surpassed expectations and showed little evidence of any dampening effect by the existence of war. The official record of registration showed 1,205 physicians, 208 exhibitors, 216 Woman's Auxiliary members, 171 nurses and 294 miscellaneous, a total of 2,094.

The banquet at the Minikahda Club was attended by over 500 members and guests in spite of food rationing and the warning given up to the day of the banquet that Congressman Walter H. Judd, the guest speaker, would be detained in Washington. Dr. Judd had reached Milwaukee when he received word to return to Washington. Weather conditions, however, prevented his return by plane and he continued his trip to Minneapolis and electrified the banqueters with his eloquence. It's an ill wind that blows nobody any good. The banqueters also heard President Baxter's address on the timely subject of "The Physician in Civic Life" which appears in this number of Minnesota Medicine. At the banquet members met Dr. Fernan-Nunez of Milwaukee, who so kindly substituted for Captain Hakansson on short notice, and gave a masterly address Wednesday on "Tropical Diseases" which was much appreciated.

The business of the Council and the House of Delegates was carried out expeditiously for the most part the day before the convention began. The use of reference committees to review and report to the House on various committee reports which has been adopted in recent years, relieves much of the onus of the delegate's job.

The delegates learned at first hand of the efficient activities of the Committee on Public Policy and in detail of the successful opposition to the reappointment by the Governor of Mr. Debel on the Workmen's Compensation Commission.

The physicians of Minnesota have the firm conviction that free choice of physician is not only one of the freedoms in a free country, but is one of the essential cornerstones of competitive practice. No one can deny that competition is conducive to better medical service. For this reason extension of practice beyond the sphere of so-called private practice is opposed.

The law in Minnesota specifically provides free choice of physician to workers coming under the Workmen's Compensation Law. Mr. Debel did not carry out the provision of this law and for this reason his reappointment was opposed, and successfully opposed. The officers of the State Medical Association appeared in the matter before the Senate Committee on Workmen's Compensation and conferred with the Governor, and the profession throughout the state in great numbers communicated their stand to the Senate Committee. It was unfortunate that the difference of opinion became so acrimonious and that the Governor accused the profession of using intimidating methods. The whole affair, however, should make it perfectly apparent that the profession of the state is prepared to fight for their convictions.

The delegates heard from Dr. Savage, chairman of the Committee on Interprofessional Relations, about the efforts of this committee in conference with the State Board of Nurses Examiners, the State Board of Health, the State Nurses Association and the Hospital Association to provide for the training of Nursing Aides. The war has only accentuated the need for young women with some training in nursing to assist in the care of the sick at home and in the hospital. The committee favors a nine months' course of training along lines to be outlined by a special committee of nurses known as the Acorns (Advisory Committee on Rural Nursing Service) in hospitals of twenty-five beds or more and the granting of certificates by the hospitals. Questionnaires have already been sent out to the hospitals concerned, and the main stumbling block so far has been that this special training will not be credited for further training as a Registered Nurse. Dr. Kurten, president of the Wisconsin State Medical Association, who was present at the meeting of delegates, stated that in

Wisconsin similar legislative provision had been made for Nurse's Attendant with a year's training in a hospital of forty beds or over.

Probably the most important action taken by the delegates was the approval of a resolution, and its submission by our delegates to the A.M.A. House of Delegates in Chicago, June 7. The resolution provides for the establishment of a Committee on Medical Service representing various sections of the country, with headquarters in Washington, which shall provide a source of information on medical matters. The resolution is the result of the presentation of the need for such an office in our national Capitol by Dr. A. W. Adson at the National Conference on Medical Service in Chicago last February. This address was published in the April number (p. 352) of MINNESOTA MEDICINE.

The delegates elected the following officers for 1944:

President: Dr. E. M. Jones, Saint Paul

1st Vice President: Dr. R. R. Cranmer, Minneapolis

2nd Vice President: Dr. M. S. Nelson, Granite Falls

Treasurer: Dr. W. H. Condit, Minneapolis (reëlected)

Secretary: Dr. B. B. Souster, Saint Paul (reëlected)

Speaker of the House: Dr. W. W. Will, Bertha (reelected)

Vice Speaker: Dr. E. A. Meyerding, Saint Paul (reelected)

A.M.A. Delegate: Dr. F. J. Savage, Saint Paul (reelected)

Alternate: Dr. George Earl, Saint Paul (reëlected)

A.M.A. Delegate: Dr. J. M. Hayes, Minneapolis (reelected)

Alternate: Dr. W. W. Will, Bertha

The annual meeting in 1944 will be held in Rochester, Minnesota, at a time to be designated by the Council.

MORE DOCTORS NEEDED FOR ARMED FORCES

AT the request of the Chairman of the National Procurement and Assignment Service for Physicians, Dentists and Veterinarians, we are publishing in this issue statements of needs by the Surgeons-General of the Army, Navy and United States Public Health Service, as well as one outlining the present situation by the Chairman.

The procurement of enough physicians for the various services has been undertaken by the professions of medicine, dentistry, and veterinary. The figures for 1942 speak for themselves. The medical profession has good reason to be proud of the result. The only possible exception is the showing made by the physicians of the states of Massachusetts, Connecticut and New York. In these populous states there are more physicians per unit of population than in most other states. We are not pointing the finger of scorn at the profession of these three states, but we do wonder what the explanation of this apparent backwardness is.

There are 2,497 physicians living in Minnesota and of these 2253 are now members of the Minnesota State Medical Association. This last figure includes the Fellows at the Mayo Clinic, but not hospital interns nor residents. At present there are 1,629 physicians in active practice in the state.

Minnesota supplied its quota of physicians for 1942 by 105 per cent. The quota for 1943 is an additional 276 at the rate of twenty-seven a month. Even by taking credit for the 5 per cent over-enlistment last year, our enlistment is lagging.

The various services want to recruit only physicians under the age of forty-five. Our State Procurement and Assignment Committee has certified 106 under the age of thirty-eight and 131 between the ages of thirty-eight and forty-five as available. This total of 237 is below the quota desired.

There is some reason for believing that our quota is too high, as it does not take into consideration that two-thirds of the medical work done at The Mayo Clinic is furnished individuals who live outside the state. However that may be, the need of the various services is great. Our country districts have been drawn upon to the limit and enlistments this year will have to be drawn from urban centers.

These facts make it clear who must make the sacrifice financially and otherwise to make up our quota. The armed forces must have physicians to care for the health of men who are serving their country and need more medical service per unit of population than civilians. Those physicians who have already joined have proven their patriotism. More patriots are needed.

DANGER FROM FLUOROSCOPY

A NUMBER of articles have been published concerning the dangers connected with fluoroscopy. Recent measurements have shown that these warnings must be taken seriously and that they concern the whole medical profession. The problem is more acute now when the serious film shortage may call for more extensive use of the fluoroscopic method, and it seems advisable to call attention to a few pertinent facts.

No fluoroscopic unit should be used unless the doctor in charge has convinced himself that the conditions under which it is operated are reasonably safe. A continuous vigilance is necessary, and it is not enough to know that the conditions were satisfactory at one time in the past.

A shock-proofed arrangement should remove electrical dangers but a broken cable or a casual repair may lead to electrical hazards, and many of the old machines have exposed high-voltage leads. Grounding a part of the apparatus may not always serve as protection, and if the ground is applied at the wrong place the danger may be increased. A careful expert inspection is needed and there can be no valid excuse for an accidental electrocution though such accidents have occurred a number of times.

Roentgen rays from fluoroscopic units have caused innumerable sequelæ to both patients and physicians, and serious damages are often still produced in spite of the knowledge that now is available.

In order to obtain adequate protection, it is first required that the tube is shielded so that no radiation of any consequence escapes in any direction except in the useful beam. This may be checked roughly with a hand fluoroscope or more accurately with a roentgen meter with a sensitivity of 0.01 r or a Geiger-Muller Counter. After this first requirement has been fulfilled several other precautions must be taken.

For any intelligent use of fluoroscopy, it is important to know the amount of roentgen rays reaching the skin of the patient and of the examiner, and that has to be determined by means of measurements. The total dose received depends upon the intensity and the time of exposure. The intensity depends upon a number of factors and varies widely in practice. A reasonable intensity at the skin of the patient nearest to the tube amounts to about 20 r per minute.

Mr. Marvin, of the division of Biophysics, University Hospitals, has recently checked some machines in Minnesota, and has found intensities during routine practice up to 114 r per minute. It is evident that such an intensity is dangerous and must be reduced by proper adjustments. The question is how many of the machines which have never been calibrated are used under similar conditions with an unnecessarily high intensity.

The intensity may be reduced by increasing the distance from the target to the patient. This distance should be at least 28 to 30 cm. It can also be reduced by lowering the current which should not exceed 4 to 5 ma. If the fluorescence is not bright enough the voltage may be raised and it is advisable to use rather high voltage, preferably 80 kv. or 100 kv. if possible with the equipment. With a high voltage a filter helps to lower the intensity considerably and a 1 mm. aluminum filter should be permanently attached.

With the use of 28 cm. target skin distance, 90 kilovolts and 4 ma. and 1 mm. aluminum filter, the intensity can undoubtedly be kept within the safe range, but it is still advisable to have it measured so that the number of roentgens applied per minute will be known.

The time used for an examination should be kept at a minimum. It should be measured and recorded. A foot switch should be used so that the current applied to the tube may be limited to the time of inspection. The use of a timer which sums up the exposure and shuts off the machine when the dose has been given was decided on, is advisable.

Some fluoroscopic examinations require an exposure of 5 minutes. With an intensity of 20 r at the patient's skin, this means a dose of 100 roentgens. A dose of 75 r is often used for treatments of skin diseases and the title of a publication in *The Journal of Radiology*, "Roentgen Therapy in Fluoroscopy" is, therefore, no exaggeration.

The rules laid down here for the safety of the patient may seem drastic. They are, however, not difficult to follow after they once have been accepted and certainly the patients have the right to expect of the physician that he takes the necessary precautions in order to avoid a serious injury from a simple examination. These rules also help to protect the examiner, though any injury to him is due to accumulation of exposure over a long time rather than to a single dose. He must be particularly careful to protect the hands

which are inevitably exposed at palpation during the fluoroscopic examination. The use of lead-rubber gloves may help but not unless the gloves are heavy and designed to shield the whole hand can they be relied upon to give complete protection. Light gloves may give a false sense of security. The examiner must in any case be aware of the danger and take all precautions possible.

The most dangerous procedure and the one which has caused most of the injuries is the setting of fractures under fluoroscopic visualization. This practice must be condemned and the radiologist in charge should enforce the rule that nobody on the staff be permitted to use the apparatus in this manner. The doctor may receive enough exposure from the setting of a single fracture to produce a severe skin reaction. It is, of course, good practice to inspect the position fluoroscopically and that can be done several times without exceeding the permissible total dose.

I have seen a number of physicians who have suffered the consequences of too much exposure during fluoroscopy. They have been severely handicapped, and at least one of them has already paid with his life. The tragedy has been extremely impressive, and it is hoped that others will heed the warnings before it is too late.

K. Wilhelm Stenstrom, Ph.D.
Professor of Biophysics,
University of Minnesota

DEATH RATE IS RISING; PNEUMONIA WORRISOME

The death rate is rising and the pneumonia situation is particularly worrisome, it appears from the Statistical Bulletin of the Metropolitan Life Insurance Company.

A 5.5 per cent increase in mortality among the company's industrial policyholders was recorded for the first quarter of this year as compared with last year's figure. For the country as a whole, an even greater rise in mortality has probably occurred. In the ninety major cities of the United States there were 9.2 per cent more deaths reported for the first 13 weeks of 1943 than for the corresponding weeks of 1942. In New York City the death rate so far this year is about 8.5 per cent higher than for the same period last year.

The war cannot be blamed directly for the increase in mortality, it appears. Among the company's industrial policyholders, the rate for deaths from enemy action for the first quarter of 1943 was more than twice that for the first quarter of 1942, but this, it is said, "does not account for the unfavorable turn in mortality for 1943. Most of the rise in rate this year has resulted from other causes."

Pneumonia seems to be the chief factor. The death rate for the first quarter of 1943 is low compared with rates prior to 1941, but is 21 per cent higher than last year's rate for the first quarter. Virus pneumonia, also called "atypical pneumonia of unknown etiology," has made up a large proportion of pneumonia cases during the past season, and this type of pneumonia is not affected by sulfa drug treatment.

Seeking to allay the fear that the rise in the pneumonia death rate presages another world-wide flu-pneumonia epidemic, the Metropolitan Life Insurance Company health authorities point out that virus pneumonia is different from both influenza and the pneumonia which accompanied influenza in 1918.

"Nevertheless, the situation needs careful watching," they state.

"The war effort would be seriously hampered by an increase in pneumonia mortality or even by a continuation of the recent level."

Meningitis mortality also increased sharply in 1943. Disquieting also is the increase in deaths from cancer, diabetes, cerebral hemorrhage, diseases of the coronary arteries and angina pectoris and the chronic heart diseases. With the exception of diabetes, the 1943 death rates for all of these are the highest on record.

Fatal accidents in the home have increased, in spite of the fact that there is very little unemployment and less time is spent in the home now than before the war.

Only cheerful spots on the current health picture are the marked decline in maternal mortality, especially noteworthy in view of the increased birthrate, and the continued decline in the tuberculosis death rate which was 6.8 per cent less in the first quarter of 1943 than in the same period last year.—*Science News Letter,* May 15, 1943.

NEW SULFA DRUG IS TWO TO FOUR TIMES AS POTENT

A new sulfa drug has been developed which promises to be a more potent weapon against intestinal infections, such as dysentery, than its predecessors in the sulfa family. Phythalylsulfathiazole is its name. It is announced in a report by Dr. Edgar J. Poth and Dr. Charles A. Ross, of the University of Texas Medical School to the Society for Pharmacology and Experimental Therapeutics.

It has two to four times the germ-checking power of succinylsulfathiazole. Doses by mouth at four-hour intervals have not caused any toxic symptoms in dog or man.—*Science News Letter,* May 15, 1943.

JAPS GET MONOPOLY OF GINSENG GROWING

The Japanese government is even in the patent-medicine racket. In Korea, it exercises monopolistic control over the cultivation of ginseng, a sarsaparilla-like plant whose root, dried, shaved up and made into a tea, is considered good for whatever ails you by millions of Chinese and Japanese. By making a monopoly of it, and forcing the Koreans to grow it at coolies' wages, the smart little brown men cut a profit both ways.

There was a short-lived boom in the cultivation of the American species of ginseng about a generation ago, but because of low-cost competition in the Orient it collapsed. The American and Asiatic ginsengs look very much alike, but are distinct species.—*Science News Letter,* February 27, 1943.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

A MEDICAL CONGRESSMAN REPORTS TO HIS COLLEAGUES

Dr. Walter H. Judd made his first home appearance since he took his seat as newly elected congressman from the Fifth District, at the Minikahda Club in Minneapolis, Tuesday, May 18, as guest speaker at the ninetieth annual dinner of the Minnesota State Medical Association.

The dining rooms of the club were packed to capacity for the occasion and many more who had sought in vain for tickets to the dinner were admitted to standing room in the rear. They were rewarded by a report which, for its wit and frankness, its earnestness and timeliness will undoubtedly go down as unique in the annals of the association dinners.

The excerpts which follow will indicate to some extent the extraordinary character of the address. It is to be hoped that Dr. Judd's advice will be soberly heeded by his medical colleagues in Minnesota.

Said Congressman Judd:

I am very happy to have this opportunity to make my first home appearance before my colleagues. This will be in the nature of a case report and a clinic. It is addressed to you, first, as doctors and, second, as citizens.

Medicine Praised

First, I want to say now that we do not realize what an outstanding job we have done in this war, as doctors. I didn"t realize it, myself, until I saw so many others, down there, in Washington, taking advantage of the war crisis to increase their own preference, standing and power. Not a single profession nor a single trade has organized itself as medicine has, seeing the need ahead even before the Army, Navy or Selective Service saw it, and working out in advance the fundamentals of providing medical service for the maimed in this war. There has been criticism, of course. Politicians took it for granted that doctors were like themselves and some of them even declared that the reason doctors were seeing to it that a sufficient number applied for service was that the older men were getting rid of the young men who endangered their practice that way. They couldn't believe, naturally, that anyone could sacrifice his personal interests for the sake of the sick and wounded of his country. It is discouraging, indeed, how few people there are in Washington who are capable of rising to the ideals which normally actuate the doctor.

Acute Problem

The war, of course, has created an acute problem in medical service. First the Army demanded 7.5 doctors to every 1,000 men. They have modified that demand to a ratio of approximately six per 1,000. But the lack of coördination and wisdom in Army planing for medical service has been disturbing. For instance, our own General Hospital Unit No. 26 sat and rotted for eight months before any use at all was made of its skilled medical personnel. There are many instances even more flagrant. The reason for it lay in bad planning, to begin with, and in unfortunate competition between military departments and the various arms of the service, each one striving for more and more men, regardless of over-all needs, and of the immediate uses to which they are to be put. Such striving is a characteristic of Washington, to be sure, and not confined to the Army. There are sections of the State Department, I am told, which haven't spoken to each other in years, though they speak about each other frequently and loudly. Medicine, I am glad to say, is head and shoulders above that kind of petty contentiousness.

No Epidemics Yet

Now, the point of this doctor situation is this: We have had the good breaks lately. We have been freer of epidemics in the last six months than at any time for which there are records. In 1942 there was not even the usual seasonal rise in the respiratory infections.

But one day we will get an epidemic. And you know, as well as I do, that we won't be able to stand a big epidemic on the basis of our present distribution of doctors.

The Doctor's Job

It is our job, therefore, to work out the problem of distribution more equitably before, not after, the epidemic comes.

Part of our problem in public health today arises

out of our very progress. There is no more enlightenment about the fundamental needs for health and there is a greater demand for hospitals, though in Washington today, not even the President's daughter could get more than four days, in case of childbirth, in any hospital in the city.

There are going to be great changes affecting medicine after the war. There is no doubt of it. And I want to see our profession right up in the front lines directing and shaping those changes. Certainly, neither you nor I want the professional philanthropists spinning out the alterations and calling the turn, though that is just exactly what will happen unless we take it over.

Danger in "Old Guard"

There are two dangerous factions in medicine as you know. One is the Old Guard which says that things must stay as they are. And there is the radical section that wants to scrap the entire system and start over. Neither of those factions can do this job.

If medicine just sits back and resists, resists, resists —the professional reformers are going to ride roughshod over our bodies and nothing can save our precious freedom.

There are borderline cases where help is needed. We all know and must recognize that. There are areas of maldistribution where action must be taken now. And it is a fact, too, that there are not enough doctors for this emergency. It's just a case for rationing, like sugar and meat. I want the medical profession to do its own job of rationing. If we don't, it's certain that the "smart" boys will.

Larger Responsibility

We've done a fine job already in this war and before. But out of it comes a greater responsibility. We can accept and carry that responsibility. What we have to fear in so doing, is the "diehards" on the one hand, who will hang back, and the scrappers on the other who want to give everything for nothing. Here is a case in point.

When I went to China, western doctors had been there forty years and still there were no Chinese students studying medicine. Chinese boys were studying law, economics, trades, however, and so I asked a Chinese father one day why he was not educating any of his sons for medicine. "We can't afford it," the father said. "We can't possibly meet the competition of the mission hospitals where everything is given free."

Exploiting the Chinese

You know that many missionaries went to China just to get stars for their own crowns—and at the expense of the poor Chinese. They measured achievement in terms of what they could give away and not in the solid lasting good they could do. They overlooked the fact that, if a medical system in China or anywhere else is not self-supporting, it is not sound. The Rockefeller Foundation made that mistake initially when it established a medical center in Pekin, for instance, which is one of the best in the world. The Chinese knew they couldn't approach what the Foundation had done, so naturally they gave up at the start and did nothing. We were trying to import and force upon them a model which it was impossible for them to reach. We forgot that self-respect and independence are engendered only when you pay your own way and those qualities are enormously more valuable than anything you can hand out to people. You don't build personality or self-respect by giving things and making people take them.

We Ask for Payment

In our own hospital we came to realize that truth and we began to ask payment for our services. The amounts were small and they were adjusted to what the people could pay, but it made all the difference in the world in the attitude of our people and the effectiveness of our service. We were not popular for it, either, with the old missionaries.

Like the missionaries, the people in our government at Washington do not always understand what constitutes real help. They forget that the objects of their assistance are human beings, with a human being's ambitions and yearnings for prestige.

Washington Headquarters Needed

We doctors have known that always, but we've been too modest to say so. We must remember, though, that the "smart boys" are not modest. They are quite willing to go ahead without advice. And the fact is there has been nobody, up to date, to advise them. I was amazed when I went to Washington, myself, to find that there were no headquarters anywhere in Washington where either the Congress or the departments or agencies could get authoritative advice on medical matters. Small wonder that they have made mistakes, and such mistakes are serious. It's the hardest thing in the world to correct a mistake once it is enacted into law by the Congress and even harder once it has been publicly released as a departmental directive.

What we medical men must do is to establish a headquarters and provide advice on the spot in Washington, not in the sense of lobbying at all, but with the object of giving counsel. You know, most of us in Congress are trying to do right, at least if our own interests aren't too seriously involved. But we need help and the medical profession must provide it.

Congress' Doctors Get Together

There are now seven of us doctors in Congress, by the way.

All of us got together, a while back, in the hope of fostering some sort of over-all scheme to take care of the medical situation. We hoped, at least, to be on the inside so as to survey the situation in the hospitals, in the Army and the Navy and Public Health Service and make an over-all plan. But we didn't get anywhere.

The Public Health Service was interested but the Army said nothing doing and the Navy was even more reluctant. Each group wants the men and the

power and neither will give way to the others. It is the same with many government agencies in Washington.

In fact, I am convinced that what we need most in Washington is more doctors in government and, above all, more of the kind of mental habits that good doctors must have.

We Need to Study Failures

First let us say we need the *autopsy type of mind* which is willing to look at its own failures and accept them without hunting around for a scapegoat. We need the type of mind which is willing to study its failures and ask itself questions so as to avoid the same failures in the future. If the trouble is in the stomach or liver, it makes no difference to the doctor whether the patient is a republican or a democrat; it is still in the stomach or the liver.

Did We Think It Was Harmless?

Second, we need the *biopsy type of mind.* In medicine we don't wait for the malignant growth to kill the patient before we do something about it. We take a sample of the growth as early as possible to see how those cells are growing. We don't say: "Oh, it's only in the toe. Let's wait until it gets to the knee to find out how it's going to spread." But in government and politics we have been doing just that. We saw what happened in Manchuria in the East and to the Jews in the West. But we waited until the growth spread to Pearl Habor. We knew it was malignant at the start. Did we think its malignancy would disappear and it would suddenly become harmless and benign when it reached us?

Third, we need the *type of mind which deals with things impersonally.* We doctors may argue about the need for an operation and one of us may lose the argument. But both of us want to see the patient get well. It is discouraging in the extreme that so many men in Washington should care so much less about seeing the patient get well than about their own vanities. They are afraid of this and afraid of that until finally they become afflicted by a kind of dry rot. They are all stooped over from keeping their ears to the ground.

Nobody Can Smear Congress

You know they try to keep a Congressman silent during his first year, knowing well that he will atrophy if they do. Soon he will acquire the universal spirit of looking out for himself first.

Save me from that! I am fortunate in having a profession for the future and no need to think about holding my job. So I am going to have a good time and do what I like. If I am sound, I believe the people will agree with me. If I am in error, it will be over in two years before the dry rot creeps up on me.

There is a great deal of talk about "smearing Congress." The fact is that nobody can smear Congress as much as Congress smears itself. A young friend on leave from the Army visited the House one day and he was amazed at what he heard there. "Imagine an Army," he said to me, "as disorganized as that."

We have no right to be as disorganized as we are. Of course we are bound to get undeserved blame and undeserved praise. Doctors get it every day, understand it and let it pass. Congress must have the same detachment.

No Sense of Balance

Fourth, we must have *the habit of thinking in terms of alternatives.* As it is, we have no sense of balance in Washington. We take a course of action and it turns out to be a mistake. What do we do? We scrap the whole thing. We do not try to save what is good and substitute other measures for what is manifestly bad. Furthermore, we think only for the present, in the present. We consider how to get rid of the ruins before the building is completed and not at all in terms of building for posterity. In fact, this generation is not living in terms of posterity at all. And yet the truth is, in government as well as in medicine, that nothing we do is worth anything unless we are building for the future.

Whether we like it or not—whether we are ready for it or not—we are now on the threshold of a new world. Our future is quite likely to be decided for a generation or more in the next six months.

If we doctors take our share of the general responsibility, if we work as a team now, perhaps we can help find an answer that will last to the question: How are we going to live in this new world?

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. Du Bois, M.D., Secretary

Minneapolis Abortionists Plead Guilty to Manslaughter

Re State of Minnesota vs. Edward H. Stanton.
Re State of Minnesota vs. Mrs. Anna Huff.

On May 17, 1943, Edward H. Stanton, forty-one years of age, and Mrs. Anna Huff, sixty-one years of age, pleaded guilty in the District Court of Ramsey County to the crime of manslaughter in the second degree. Stanton, because of a prior conviction, was sentenced to a term of two to five years at hard labor in the State Prison at Stillwater. Mrs. Huff was sentenced to a term of up to five years at hard labor in the Women's Reformatory at Shakopee. Both sentences were imposed by the Hon. Gustavus Loevinger, Judge of the District Court.

Both defendants were arrested on April 24, 1943, by the Saint Paul Police Department, following information furnished to the Minnesota State Board of Medical Examiners that a Saint Cloud woman was in a dying condition at Midway Hospital in Saint Paul following an alleged criminal abortion. The investigation disclosed that the patient had been aborted by the defendant Stanton at the defendant Huff's residence, 2027 Sheridan Avenue North, Minneapolis. When it became apparent to the defendants that the patient was critically ill, the patient was taken to a Saint Paul physician; a second physician was called in consultation and the facts brought to the attention of the Minnesota State Board of Medical Examiners. The patient died the next morning.

Stanton admitted to the Court that he had performed between twenty and twenty-five criminal abortions at Mrs. Huff's residence, the money usually being paid to Mrs. Huff, who retained the greater portion of it. In the present case, $100 was paid to Mrs. Huff who retained $90.00, giving Stanton only $10.00. Stanton stated that from 1935 to 1939 he was employed as a male nurse and orderly at the University Hospital in Minneapolis. He also stated that for several months in 1941, he was employed in a similar capacity at Minneapolis General Hospital. From 1925 to 1930 Stanton stated to the Court that he was a member of the Minneapolis Fire Department. Stanton claims that he was born near Red Wing, Minnesota, and that he is of one-eighth Indian blood. Mrs. Huff told the Court that she was born in 1881 in Sweden, married three times and all three husbands disappeared. She claims to have had some training as a practical nurse, and that for the past seven or eight years she has taken care of girls and married women who were aborted in her home. She named several individuals as having performed criminal abortions at her home. One of these individuals is dead and another one is now serving time in the State Prison at Stillwater. Ordinarily, the defendants would have been prosecuted in Hennepin County, but because of the death of the patient in Ramsey County, the law permits the prosecution to be had in either county. The splendid results obtained in these two cases are due, in no small part, to the prompt and efficient work done by the Saint Paul Police Department and the Ramsey County Attorney's office.

License of Minnesota Physician Suspended Following Conviction at Portland, Oregon

Re: Revocation of the License of Herman J. Holte, M.D.

Following a hearing held on February 13, 1943, the Minnesota State Board of Medical Examiners suspended, for a period of five years, the license to practice medicine formerly held by Herman James Holte, forty-two years of age. Dr. Holte pleaded guilty in the Municipal Court of Portland, Oregon, on June 29, 1942, to the crime of petit larceny. He was sentenced to 180 days in the Multnomah County Jail. On the same date he also pleaded guilty in the same Court to a charge of drunkenness and was sentenced to a term of thirty days in the Portland City Jail. Because Dr. Holte's services were needed at the Eastern Oregon State Tuberculosis Hospital at The Dalles, Oregon, he was paroled by Judge Quillin on August 7, 1942. However, on August 29, 1942, Dr. Holte was again arrested in Portland as a parole violator, and for drinking on the street, and on August 31, 1942, Judge Quillin revoked Dr. Holte's parole and ordered him to serve the balance of his previous sentence and thirty days additional, plus a fine of $40.00. Judge Quillin also ordered that if the fine was not paid, that Dr. Holte serve an additional fifty days.

Dr. Holte graduated from the University of Minnesota with a degree of Bachelor of Medicine in 1929. He received his Doctor of Medicine Degree in 1931. He was licensed to practice medicine in Minnesota on February 4, 1930, by examination. Dr. Holte practiced medicine for short periods of time in the State of Washington, and also in Minnesota. Prior to being arrested in Portland, Oregon, Dr. Holte was arrested on numerous occasions for drunkenness. Several attempts were made by Dr. Holte's friends to have him abstain from the use of intoxicating liquor, and the Minnesota State Board of Medical Examiners coöperated in every way in these efforts. Dr. Holte did very well for a time, but again reverted to his old habits leaving the Medical Board with no alternative except to suspend his Minnesota license.

Manitoba Physician Loses Minnesota License Following Conviction

Re: Revocation of the License of Robert William Henry Guilmette, M.D.

The Minnesota State Board of Medical Examiners suspended, for a period of five years, the Minnesota license to practice medicine, formerly held by Robert William Henry Guilmette, M.D., of Berens River, Manitoba, Canada. At a hearing held on February 13, 1943, evidence was presented to the Medical Board showing that Dr. Guilmette pleaded guilty on the 27th day of March, 1941, at Winnipeg, Manitoba, to violating "The Opium and Narcotic Drug Act of 1929, of the Dominion of Canada." The specific charge was that Dr. Guilmette executed a prescription to himself for a narcotic drug, the drug not being required for medicinal purposes. Dr. Guilmette's name was erased from the Medical Register of the College of Physicians and Surgeons of Manitoba on May 14, 1941, because of his conviction.

Dr. Guilmette was born at Winnipeg, Manitoba, in 1879. He obtained his Medical Degree from the University of Manitoba in 1907 and was licensed to practice medicine in Minnesota in 1912, by examination. Dr. Guilmette practiced in several communities in Minnesota, returning to Winnipeg where he registered in January, 1932.

Habitual Drunkenness Leads to Revocation of Minnesota Physician's License

Re: Revocation of the License of Robert F. Werner, M.D.

At a meeting of the Minnesota State Board of Medical Examiners held on April 10, 1943, the license to practice medicine formerly held by Robert Frederic Werner, M.D., was permanently revoked. Dr. Werner, who is only forty-two years of age, has a long record of habitual indulgence in the use of intoxicating liquor. Dr. Werner was an inmate of the Willmar State Hospital on five different occasions for alcoholism; the first time in 1934, three times in 1936, and again in 1942. On December 12, 1940, Dr. Werner's license to practice medicine was suspended for a period of five years because of habitual indulgence in the use of morphine sulphate and other derivatives of opium. While this suspension was in effect, Dr. Werner was arrested in Minneapolis for checking on a bank without sufficient funds. On January 8, 1942, he was sentenced to one year in the Minneapolis Workhouse for that offense. Shortly thereafter he was committed, as an inebriate, to the Willmar State Hospital by the Probate Court of Hennepin County. Dr. Werner made splendid progress while undergoing treatment at Willmar and, due to the necessity of additional medical care at the Hospital, the Medical Board terminated the suspension, previously imposed, of Dr. Werner's license, upon the express condition that he refrain from the use of alcoholic liquor and upon his further promise to remain at the Hospital for one year as a physician employe. Dr. Werner violated his promise shortly thereafter by becoming intoxicated and finally abandoning his work.

Dr. Werner graduated from the University of Minnesota, receiving his Bachelor of Medicine degree in 1926. He was licensed the same year by examination and has practiced medicine at International Falls and Herman, Minnesota, and other communities for short periods of time.

War Bulletins

STATEMENT OF CHAIRMAN, DIRECTING BOARD PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

Figures are now complete on the 1942 quotas for supplying physicians of the various states. Forty states have exceeded the 100 per cent figure of their quotas. Five states were above 90 per cent of their quotas. Four states—New York, Connecticut, Massachusetts, and Nevada—were below 90 per cent of their quotas.

Nevada is the lowest state, but has a total quota of but thirty-five doctors. It has provided twenty-three and deserves special consideration because its population is thinly scattered over wide areas.

This statement would not imply any reflection on the patriotism of those members of the medical profession who have been marked available by the Procurement and Assignment Service in these three states and who have not sought a commission. I would only present the facts and let each one draw from these facts whatever deductions he individually chooses.

Certain unavoidable considerations must be faced in these figures. Four states failed to provide 90 per cent of their 1942 quotas of doctors for the services. Three of these states—New York, Connecticut, and Massachusetts, are Eastern Seaboard States and among the most populous ones in the Union. These populous states have large cities in them which now have more doctors per thousand persons than most other parts of the country. Largely because those doctors marked available by the Procurement and Assignment Service have not sought commissions these states are below their quotas.

Unless more of the doctors found available for military service by the Procurement and Assignment Service in these cities apply for a commission in the armed forces with reasonable promptness still more doctors must come from rural communities. This will greatly complicate the problem for those communities in their own and other states since many rural communities are already none too well supplied with doctors. Such inequalities in medical service as now exist become practically insurmountable for the Procurement and Assignment Service with its present limited authority. With all these facts in mind, with the responsibility of medicine to the country and to itself such as it is, the quota figures should be brought up to par by an intensive effort of the State Medical Societies through their executive bodies preferably by an organized State Medical Society campaign.

The provision of doctors for the armed forces is not only the special obligation of medicine but a responsibility which it acknowledges and accepts as its part in the war effort. Each state that has not met its 1942 quota will be kept informed of its position in relation to its quota and its position in relation to other states.

STATEMENT OF THE SURGEON GENERAL OF THE UNITED STATES ARMY

The Army is increasing in size; more medical officers are required. New units are being formed and many new general hospitals are under construction at many points in the United States. Some basic training must be given to medical officers before they are assigned to purely medico-military duties; for this reason, they are needed one or two months prior to actual assignment. For the protection of the health of the civilian population, the quotas for physicians must be fairly distributed throughout the country. Certain states are far behind; they will, it is hoped, do everything possible to furnish their quotas at once.

STATEMENT OF THE SURGEON GENERAL OF THE UNITED STATES NAVY

In order to plan intelligently I have reviewed the personnel situation in the Medical Department of the Navy. There is a deficit of approximately 900 medical officers for the next six months, based on minimal requirements. The Bureau of Medicine and Surgery calls medical officers to active duty when billets are available, does not build up too large a Reserve at any time. Consequently, procurement must go on in an orderly fashion, if we are to meet the demands that will be placed upon us as the offensive fighting develops. We can not afford to have the deficit increase beyond its present level; if it does we will not be able to give first-class medical service to our wounded.

The Medical Department of the Navy is charged with maintaining the health of all the personnel of the Navy and the Marine Corps; in addition it must care for the dependents of the officers and men. We look to the medical profession of our nation to come forward with the available doctors that can be spared from civil life to aid in our military necessity. In the main, the profession has responded nobly. There are some localities where this is not so. In those localities the medical profession should cause the pressure of public opinion to bear on all eligible doctors and thereby bring to their attention the seriousness of failing to do their patriotic duty.

The medical profession is faced with a challenge of furnishing medical service to the Armed Forces and to the civil population during the active state of war and in the postwar period, which we hope is not too far distant. Should the profession fail in either regard many forces may develop that will destroy the practice of medicine as we know it. This would be disastrous and it is something that we can not afford to allow to come about. In all seriousness, the doctors of medicine in the United States should take stock carefully of their own immediate situations and should give every assistance in planning to see that medicine plays its responsible part in this and coming years.

STATEMENT OF THE SURGEON GENERAL OF THE U. S. PUBLIC HEALTH SERVICE

During the next twelve months, the Public Health Service will require approximately 600 medical officers for full-time active duty in the reserve commissioned corps. These physicians will be recruited on an average of fifty a month—twenty-five for service in the U. S. Coast Guard, and twenty-five for general service.

In addition to the medical officers assigned to the Coast Guard, physicians are needed for duty in the Marine Hospitals and the medical program of the War Shipping Administration, as well as for detail to general public health work in State and local health departments, and for such specialized war programs of the Public Health Service as tuberculosis control, venereal disease control, industrial hygiene, and community medical services.

The Service also expects this year to commission some 5,000 physicians in the inactive reserve. These doctors will be available for active duty in the event of acute emergency in their own or nearby communities. They will not be called for active duty unless an acute emergency exists, and will be retained only for the duration of such an emergency. This recruitment of inactive officers is undertaken as a part of the coöperative program of the Public Health Service and the Office of Civilian Defense.

The needs of state and local health departments for physicians have increased greatly during the past year.

n January, 1942, it was estimated that state and local ealth departments would need 600 physicians. As of anuary, 1943, the exact needs have not been determined, ut the Public Health Service has, at the present time, equests from the states for 185 medical officers to be ssigned to duty in war areas alone.

According to reports from State Procurement and Assignment chairmen, as of March 23, 1943, 286 additional doctors for civilian practice are needed in 176 counties located in thirty-eight states. Another twenty-wo counties in the same states report a shortage of hysicians but do not specify the numbers needed. In he remaining ten states, no needs were reported.

These 198 counties reporting immediate needs repre-ent only 7 per cent of the 2,654 counties in the thirty-ight states, and only 6 per cent of all counties in the ountry. Nevertheless, it is apparent that civilian com-nunities are feeling the pinch of the physician-shortage ncreasingly, since experience has shown that local needs ecome acute before they are expressed in formal re-orts. In the joint studies made in forty-two areas by he Public Health Service and the Procurement and Assignment Service, it has been determined that fifty-ine physicians and five dentists, or sixty-four medical nd dental personnel, are needed in these areas—an av-rage of 1.5 per study. The Public Health Service has een requested to supply thirteen of these physicians nd dentists, or 23 per cent of the determined need.

On the basis of these forty-two studies, it is esti-nated that 500 physicians and dentists will be needed n 332 areas to be surveyed in the next coming four-een months, or by June 1, 1944. It is anticipated that 0 per cent of these, or 400, will be supplied by volun-ary relocation through the regular channels of Pro-urement and Assignment, and that the Public Health ervice will be requested to assist in meeting the needs or the remaining 20 per cent, or 100 physicians and entists. This may be done either through financial as-istance to physicians desiring to relocate in areas re-uiring their services, or through assignment of Pub-ic Health Service personnel upon request of the proper uthorities.

Although it is impossible to project with accuracy he 1943 needs of civilian communities, we must face the act that the shortage undoubtedly will increase during nd after the filling of the 1943 military quotas; and hat the chances of meeting civilian needs as well as eplacing physicians who die or withdraw from practice ecause of disability, will correspondingly decrease. urthermore, we cannot predict at this time the pos-ible needs of certain rural areas, which now may be dequately supplied but which will require additional ublic health and medical services during 1943, should he Government move a large number of farm families nto these areas for the food production drive. It is be-ieved that joint action of the Public Health Service nd the Procurement and Assignment Service will serve o meet urgent needs in civilian communities.

MORE THAN 97 PER CENT RECOVER

More than 97 per cent of Navy and Marine wounded ave recovered; incomplete data on the Army show that here has been a like recovery of wounded soldiers.

Of all the Navy and Marine men wounded up to the irst of April, only 22½ per cent died; 53 per cent re-urned to active duty.

This record is due to the best medical care and equipment ever supplied an army, declares the official OWI report.

A first-aid packet strapped to the soldier's belt is he first treatment available. If the wounded soldier is conscious he begins to take sulfa tablets as soon as he s hurt, and dusts sulfa powder into the wound. If he s unconscious, his comrades may give him this first wound treatment.

Soon a Hospital Corpsman with a larger kit of supplies comes along and quickly ministers to the wounded man. An injection stops pain almost instantly. To his belt he ties a tag, telling what treatment was given, marks the spot for the litter-bearers, and goes on.

Litter-bearers take him to the battalion aid station, which can be compared to the emergency room of an ordinary hospital.

If severely wounded, he will eventually reach the great general or base hospitals. Some cases are flown all the way back to the United States.

Flexibility is what makes the system successful; mobility is the keynote.

One of the newest mobile units is the traveling optical laboratory. When a soldier who wears glasses has them broken, an optician is right at hand. The soldier is back on duty in a few hours.

The mobile bacteriological laboratory is a miniature Health Department on wheels. Laboratory tests show whether water is fit to drink, reveal the nature of any disease which breaks out, and checks the purity of food products.

There are also mobile x-ray machines—the best in the world. Composed of compact sections easily taken apart, an outfit can be fitted into three small trunks.

Extensive research is developing new Army and Navy medical equipment. Folding litters and folding arm and leg splints have been invented. A jungle kit contains apparatus for treating snakebite, various kinds of drugs from aspirin to atabrine, salt tablets to prevent heat cramps and an insect repellent.

The kit developed for our Arctic fighters contains material for preventing and curing frostbite, and multi-vitamins to help maintain fighting strength even on limited rations.—*Science News Letter,* May 29, 1943.

UNSAFE JOBS FOR YOUTHS

When boys and girls sixteen or seventeen years old go to work in a war factory, there are certain jobs that are safe for them and others which are too dangerous. Grown-ups, for example, can, unless they are unusually susceptible, work in an atmosphere in which there are 1.5 milligrams of lead in every 10 cubic meters of air. Such an atmosphere is not safe for boys and girls, in the opinion of the U. S. Children's Bureau.

No workers under eighteen years of age, the Children's Bureau advises, should be employed at the following types of work:

1. Work in connection with the production of white lead or other salts or oxides of lead.
2. Work in workrooms in which lead salts or oxides are used in such a state that they give rise to lead dust in the air.
3. Work in occupations in which metallic lead is regularly used in the molten state.
4. Work in connection with tetraethyl lead.

Types of work suitable for young workers, provided the work is done in rooms segregated from those in which lead compounds are used in the dry state and are essentially free from lead in the atmosphere, are:

1. Can filling and labeling in paint factories.
2. Marking and testing of storage battery cases.
3. Shipping-department work.
4. Machine-shop, woodworking, and other shopwork not covered by existing regulations.
5. Laboratory work.
6. Office work.

Further details about safe and unsafe work for young workers appear in a series of advisory standards being issued by the Children's Bureau, U. S. Department of Labor.—*Science News Letter,* May 15, 1943.

Minnesota Academy of Medicine

Meeting of March 10, 1943

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club, on Wednesday evening, March 10, 1943. The meeeting was called to order at 8:15 o'clock (following dinner) by the Vice President, Dr. Walter Camp, in the absence of Dr. L. B. Zimmermann.

There were forty-two members and two guests present.

Minutes of the February meeting were read and approved.

Dr. Wangensteen introduced Dr. Alfred Blalock, of Johns Hopkins Medical School, who gave a short talk and expressed his pleasure at being here and meeting various members of the Academy.

The Secretary read a letter from Dr. Oscar Owre, who stated that he is taking a leave of absence from active practice for an indefinite period. Due to this fact his name had been proposed as applying for admission to the Senior Membership group, and a motion was seconded and carried that this be done.

The Secretary read a letter from the House Committee Chairman of the Town and Country Club to the effect that due to rationing and their inability to obtain sufficient food supplies, they would no longer be able to serve dinners for large gatherings like the Academy. After some discussion it was decided to have a committee investigate the possibilities of other club facilities or changing the menus at the Club and continue the meetings, the Academy members to abide by the decisions of the committee.

The scientific program followed.

LARYNGEAL PALSY

Some Remarks on Paralysis of the Inferior Laryngeal Nerve, with Case Reports

KENNETH PHELPS, M.D.
Minneapolis, Minnesota

Voice production by the vocal cords has long been of interest to the medical men and to the educator (speech teacher, singing teacher). Recently a new group, the radio, movie, phonograph and telephone men, who are also interested in voice reproduction and amplification, have carried on many studies of the speech mechanism taking advantage of the equipment available in their fields: microphones, amplifiers, oscillographs, acoustic filters, sound films and phonograph records. Color motion pictures of the vocal cords in action, with sound effects, have been made, one of the most remarkable of which was produced by the American Telephone and Telegraph Company. The vocal cords can be viewed directly, by reflection, stereoscopically, with a stroboscope and periscope, and x-ray including tomography will demonstrate the vocal cords. Some instruments allow many observers to view the vocal cords simultaneously.

All of this activity has impressed upon us how little we know about the vocal cords and their very complex action. By means of moving pictures it was learned that the high tones are produced by a vibration of a small portion of each vocal cord and soon it was found that the thyroarytenoideus muscle has six fasciculi, with fibers of different origin, insertion, and actions, which explains how a varying extent of the vocal cords can be put under tension.

The peripheral nerve supply to the vocal cords consists of the superior and inferior laryngeal nerves, right and left. All of the vocal, respiratory, and valvular movements of the vocal cords, as well as their sensation, has to be controlled by these nerves, which are branches from the vagus. Some facts about these two nerves seem well established.

1. The superior has two branches, the sensory to the larynx and the motor nerve to the cricothyroid muscle.

2. The inferior is a motor nerve and originates as the accessory part of the spinal accessory nerve.

It is thought that the accessory nerve and the inferior laryngeal nerve are practically the same. There still is no general agreement as to whether the superior nerve supplies the interarytenoid muscles as a motor nerve or not. Nordland found it to be the exclusive supply in some cases while in others both the superior and inferior laryngeal go to this muscle.

For many years the laryngologist has attempted to diagnose the type of recurrent nerve paralysis by the position of the vocal cords. Mid-line position was thought to be a paralysis of the abductor fibers only. The adductors being active and unopposed, held the cord in the mid-line. Conversely the position of wide separation was called adductor paralysis. The cadaveric position (midway between the wide separation and approximation) was due to complete paralysis. The abductor fibers were said to be more vulnerable and in progressive disease abductor paralysis (mid-line position of the cords) always occurred first and later when the paralysis became complete the cord would move laterally to the cadaveric position.

Many cases of surgical injury to the recurrent nerve have been observed with sudden, complete paralysis of the vocal cord resulting. The nerve has been examined microscopically in numerous cases at postmortem and positive proof obtained that there was a *complete* loss of function. In these cases, the position of the vocal cord may at first be cadaveric but in nearly every case the permanent end result is the mid-line posi-

ion. This upsets the theory of abductor paralysis being the proper diagnosis.

The explanation of the mid-line position of the cord, n total paralysis of the recurrent nerve, may be that he superior laryngeal has some adductor function. Working on that theory, it would seem that if the superior nerve were also paralyzed there could be no adductor function and the vocal cords would no onger remain in the mid-line position. I saw a patient with one vocal cord in the mid-line position. Dr. Martin Nordland cut the superior laryngeal nerve on the same side and we were disappointed in seeing no change in the mid-line position of the cord. This patient was in Glen Lake Sanatorium and he was observed for many months.

Perhaps the best explanation for the mid-line position of the cord in total paralysis of the inferior laryngeal nerve is that accepted by the orthopedist following total paralysis of motor nerves. The muscle s flacid, then atrophic, becoming fibrotic eventually resulting in contraction. This series of events occuring n the musculature of the vocal cord would explain its being pulled into the mid-line position. The muscle transplant operation of King is based on this reasoning and seems to be the best form of treatment for the bilateral mid-line paralysis (not abductor paralysis). I have seen five cases of mid-line bilateral paralysis, but all have been unwilling to have the King operation, preferring to wear a tracheotomy tube continuously.

Case Reports

1. Case of neuritis of the recurrent laryngeal nerve following exposure to cold (like Bell's Palsy). Complete paralysis of one vocal cord with complete spontaneous recovery.

2. Case of complete paralysis of one vocal cord. A pharyngeal diverticulum was found on the same side. No operation for the diverticulum has been done as yet.

3. Case of complete paralysis of one cord coming on immediately following the first stage of an operation for pharyngeal diverticulum. The voice improved following the second stage, but the vocal cord is still totally paralyzed. Lahy warns of the danger of injury to the nerve as the base of the sac is stripped free of the muscle fibers of the inferior constrictor.

4. Case of thryroiditis—with pus found in the thyroid. Vocal cord paralysis developed and a carcinoma of the esophagus was found which had invaded the thyroid.

5. Case of thyroiditis with paralysis of the vocal cord developing and marked stridor. X-ray of the lungs showed multiple metastic carcinoma.

6. Old case of total mid-line paralysis of one vocal cord. The tomograph was interpreted as showing a tumor of the larynx invading the healthy vocal cord. Direct laryngoscopy showed no tumor but atrophy of the paralyzed cord with hypertrophy of the opposite side.

Conclusions

1. The mid-line position of the vocal cords results from total paralysis of the recurrent laryngeal nerve and is not a partial paralysis and should not be called "abductor paralysis."

2. A complete loss of function may return, as seen by laryngoscopy. However, an improvement in the voice does not mean a recovery from the paralysis. That may be due to the mid-line position of the paralyzed cord plus a compensatory action of the healthy vocal cord.

3. Pharyngeal diverticulum or the surgical treatment of it may produce recurrent nerve paralysis.

4. Patients treated for thyroiditis and developing a vocal cord paralysis should be investigated for cancer of the thyroid.

5. Too definite diagnoses should not be made by the laminogram. Direct laryngoscopy should be done to confirm such diagnosis.

Discussion

Dr. Arnold Schwyzer, Saint Paul: I think this is an excellent talk. That we may have paralysis of the recurrent laryngeal nerve in operating on a diverticulum of the esophagus was something that had not occurred to me, but it is important to know this. That we may have paralysis in thyroiditis is important too, especially if the posterior part of the thyroid is the seat of the trouble. I remember a young woman who had very high fever (105°), chills, sore throat, was delirious, and had just a little bit of pain on the left side of the neck. I made a diagnosis that she probably had thyroiditis or a small abscess on the posterior side of the gland. This brings it in direct contact with the recurrent laryngeal nerve. These cases, unless recognized early, are liable to make very serious trouble, as the infection can travel downward into the mediastinum.

For the surgeon, paralysis of the vocal cord is something so mean that a laryngoscopic examination should be made before operation. If on one side there is a preoperative paralysis we have to be very careful when we come to the area of the recurrent laryngeal on the other side. I can't agree with Dr. Lahey who makes it a rule to lay the recurrent bare routinely and then to follow it up so as to avoid it. I think we are very liable to damage it unless we have the dexterity of a Lahey. One other point I read of recently. In handling the upper horn of a bulky goiter, if you pull hard, you are liable to get paralysis of the external branch of the superior laryngeal nerve which runs in the connective tissues close to the upper horn. If one has a bulky goiter, one is liable to overstretch this nerve and get a paralysis of the anterior cricothyroid muscles. The thyroid hinges on the cricoid and is pulled forward by these muscles. They are thus tensors of the cords. Young patients may get over this but the older they are the more trouble they may have. The tension of the cords is greatly reduced and the voice becomes deep and even aphonic in a severe injury. This can happen just through forcible pulling on the upper horn of the goiter and a consequent overstretching of the nerve. The recurrent laryngeal, of course, is till more endangered in thyroidectomy than the superior laryngeal nerve. Apart from the cutting, there are cases (though I have not seen one) where apparently the pulling on the gland is liable to pull just enough so that only the fibers which run straight back to the crico-arytenoid muscles are affected and we get what is called a posticus paralysis. It appears in these cases that there is not a complete laryngeal paralysis but just the direct fibers which run straight back to the crico-arytenoid muscles are affected.

When you have a severe dyspnea following paralysis, as the Doctor mentioned, a tracheotomy, of course, is the simplest and, under ordinary conditions, the best. I remember one patient who had a terrific stricture of the larynx due to a luetic condition where we used another procedure. Instead of making a tracheotomy

which would have had to be permanent, I slit the thyroid cartilage, not in a straight up and down manner, however, but making the incision in a curved way so as to cause some protruding points which could be sewed together with linen so that there was a gap formed betwen the cords permanently, but the wound is closed and the larynx remained open.

Cutting the recurrent laryngeal nerve at times occurs in surgery of the thyroid and is very unfortunate. One such case I remember. I saw the patient about a year and a half after the operation. The neck had a very neat scar. The thyroidectomy was nearly complete. I operated on this patient about four or five years before Lahey published his first paper on repair of the recurrent laryngeal nerve. I used an ordinary parlor magnifying glass, which was sterilized. The recurrent laryngeal nerve was looked for first low down in the neck in the groove between trachea and esophagus. From there I followed it up and found it cut about half an inch below the upper border of the cricoid. Then we found a short stump which was left of the upper portion near its disappearance into the depth. You may remember that the thyroid cartilage hinges on the surface of the cricoid by short lateral articular prominences. Just behind this articulation the nerve dips into the interior of the larynx. Stretching the nerve very gently and starting low down in the neck, gradually working upward, the two ends could be united with a little black silk. The result was so surprising that I knew at once we had to deal with some fraud. After about three days that woman—very neurotic—could talk so loudly that I could understand her well from a distance of 50 or 60 feet. The patient had been absolutely aphonic before operation—or rather made others think so—because she had it in for the other surgeon. I told her what I thought of the case, which made her furious. Thus, I missed a chance to find out if the vocal cord had improved. Later she sang in a church choir. I feel sure, now, she had been completely aphonic because she wanted to be. Perhaps she could have sung without my operation.

CHRONIC OR RECURRENT BRUCELLOSIS

F. H. K. SCHAAF, M.D.

Minneapolis, Minnesota

Abstract

Brucellosis in Minnesota is most commonly due to brucella abortus or suis, but it must be remembered that the melitensis or goat-type may occur. Differentiation of the three strains is extremely difficult even in the best equipped bacteriological laboratory. In Minnesota only eight cases of brucellosis were reported in 1927; ninety-three in 1939, (188 in Iowa, 372 in Oklahoma). In 1942, 268 cases were reported to the Board of Health in Minnesota, but 7,440 blood specimens were sent in for agglutination tests. Only 477 gave a typical positive test in a dilution of 1:80 or above. Of 398 blood cultures only 29 or 7.2 per cent were positive.

The conclusion that a great many acute and chronic cases remain undiagnosed, is inevitable. The disease may attack any part of the human body. Chronic spondylitis may be due to brucella infection, but its suggested relationship to rheumatoid arthritis and coronary heart disease, appears to be without foundation. Chronic brucellosis may follow severe, acute infection (less than 10 per cent), or start insidiously with obscure and comparatively mild symptoms, such as malaise, weakness, loss of weight, some fever, andorexia, headaches, mental depression and excessive perspiration. Frequently it is diagnosed, without doubt, as an influenza infection. An absolute diagnosis can be made on the basis of positive blood cultures only. However, these are too frequently negative in both acute and chronic cases to be of value as a routine measure in general practice. Agglutination tests are more often positive but must be carefully evaluated when occurring in a dilution of 1:80 or less. Severe acute cases may never develop a positive agglutination titer and again a high agglutination titer developed during an acute attack may persist for many years without actual active infection. The intradermal skin test has exactly the same significance as the Mantoux test for tuberculosis. No matter how strongly positive it reacts, it does not mean active disease. Further studies on the value of the intradermal test in the diagnosis and its relationship to the production of opsinins and agglutinins are needed before this most sensitive test can be recommended as a routine procedure, or eliminated as too sensitive and confusing.

Examination of the blood in acute cases most frequently shows a normal or only slightly elevated leukocyte count; in a few instances relative lymphocytosis. In chronic cases normal values are most common. The sedimentation rate was normal in all cases examined; therefore, of considerable help in the differential diagnosis from other infections.

The sulfonamides are of no value in chronic brucellosis. Vaccine therapy has given satisfactory clinical results in most instances. Four typical cases of chronic brucellosis were reported in detail.

Discussion

Dr. Erling W. Hansen, Minneapolis: I think it hardly fair to Dr. Schaaf to leave out the urologist, the otolaryngologist and the psychiatrist when he brought up this subject. I have been interested in this from the standpoint of eye, ear, nose and throat chiefly because of two cases, one being one of our younger medical men who was practicing in the country. He was brought down for operation on the frontal sinus. After studying him in the hospital, it was discovered he had brucellosis. It wasn't so very long after, that a man came from that same territory with a note from the doctor for our best attention. He came for a mastoid operation because of severe pain he had over the region of the right mastoid. Neither one of these, from last reports, had any encephalitis so far as could be determined. The young physician later had a Fellowship in surgery and has now been accepted in the Navy so apparently there is no aftermath. In Huddleston's interesting book on brucellosis, he has a chapter on the various parts of the body. I found that headaches which simulate almost any condition in the head are very frequent. That is true also of everything else that Dr. Schaaf has said. There may be symptoms that simulate many other conditions. There is no question but what there is a good deal of brucellosis in Minnesota, as well as in Iowa, Michigan, and California where most of the reports come from. I think Dr. Schaaf's paper will help to call attention to it here. It is a very important subject and I believe Dr. Schaaf should be commended for bringing it to our attention.

Dr. A. Stewart, Saint Paul: I want to ask Dr. Schaaf if children recover quicker than adults. I have

ne child now who after about four weeks is apparntly normal.

Dr. Schaaf: Yes, children seem to have a greater atural resistance than adults. As a matter of fact, evere, fulminating infections are quite rare in children; mild infections are probably quite common. They re usually called grippe. The differential diagnosis s not easy, but perhaps less difficult in the acute cases, ecause in this part of the country we have very little yphoid to deal with, and we see only an occasional ase of malaria. The differential diagnosis from miliary uberculosis or subacute bacterial endocarditis, may eep one in suspense for several weeks. I have seen uite a few patients with brucellosis the past few years, nd feel that we should endeavor to make the general ractitioner more conscious of the fact that this disease xists in great numbers in the rural districts. However, we must realize that there is a great need for urther development and careful checking of our diagostic tests. Of the two young men Dr. Hansen menioned, one of them had an extremely severe case ue to a milk-borne infection. He had several recurrences, but is apparently well today. The bovine and porcine types do not produce the undulant fever curves reported in the infections due to the goat strain. Eye symptoms are not infrequent. Headaches may simulate sinus or mastoid disease. Any part of the human anatomy may be involved in the clinical picture.

Dr. C. B. Drake: Can it be contracted by milking?

Dr. Schaaf: Yes, it can be through the skin and gastro-intestinal tract.

Dr. J. M. Armstrong, Saint Paul: Is it the same thing as milk sickness?

Dr. Schaaf: I am quite sure it is the same thing; in fact, the original description of brucellosis goes way back to Hippocrates.

The meeting adjourned.

E. V. Kenefick, M.D.
Secretary

REPORTS and ANNOUNCEMENTS

MPORTANT ANNOUNCEMENT

The Centaur Company, makers of Fletcher's Casoria, inserted a warning in every newspaper in the ountry on May 5, 1943 to the effect that all Fletcher's astoria shipped since March 1, 1943 contains a foreign ngredient, which causes nausea and vomiting. Inasnuch as neither retailers nor consumers can disinguish between packages containing the product manuactured before March 1 and after that date, the roduct has been withdrawn from the market and etailers have been asked to return all stocks on hand.

ENNEPIN COUNTY MEDICAL SOCIETY

Election of Dr. Thomas J. Kinsella as new president f Hennepin County Medical Society was announced Monday night, May 3, 1943, at a "recognition meeting" eld in the Society rooms in the Medical Arts Building, Minneapolis, honoring its one hundred thirty-seven nembers now in military service.

Other new officers announced were: Dr. James K. Anderson and Dr. A. E. Cardle, vice presidents, Dr. D. A. MacDonald and C. A. McKinlay, directors; Drs. F. G. Benn and Julius Johnson, members of board of ensors; Drs. S. R. Maxeiner and O. W. Yoerg, members of board of ethics, and Drs. James A. Johnson and T. W. Weum, trustees.

Drs. W. H. Aurand, A. E. Benjamin, Frank R. Hirschfield and Theodore H. Sweetser were named delegates to the Minnesota State Medical Association.

Tribute to physicians and surgeons in the armed services and to their families was paid by Col. William G. Guthrie, Fort Snelling, who explained work of military hospitals.

"I can speak highly of Minnesota doctors and men in service from first-hand experience with them," said Colonel Guthrie, "because I was surgeon of the Fifth Army Corps at Camp Claiborne, La., when the 34th Infantry division, composed largely of men from Minnesota, was trained there."

The Rev. David Nelson Beach also spoke, and a stand of colors, gift of the Woman's Auxiliary to the Society, was presented by Mrs. Joseph M. Hall, Auxiliary vice president.

Newly elected candidates will take office in October..

MINNESOTA SOCIETY OF NEUROLOGY AND PSYCHIATRY

The May meeting of the Minnesota Society of Neurology and Psychiatry was held at Rochester, Minnesota, Saturday, May 29, 1943. Dr. A. W. Adson was in charge of the program which included the following surgical clinic, presentations, and scientific cinema: Surgical Clinic—Demonstration of Prefrontal Lobotomy, Dr. J. G. Love and Dr. A. Uihlein; Prefrontal Lobotomy—Dr. M. C. Petersen; Sleep Paralysis—Dr. J. G. Rushton; The Anatomic Basis of Cerebellar Symptoms—Dr. J. R. Brown; Scientific Cinema—Myasthenia Gravis—Dr. L. M. Eaton.

Luncheon was served at the Mayo Foundation House. The guest speaker was Mr. Geoffrey Jefferson, dean of British neurosurgeons, who told of his war experiences.

WASHINGTON COUNTY

The regular meeting of the Washington County Medical Society was held May 11 at the Stillwater Club rooms.

The attendance was unusually good, due to the interesting program. A colored talking motion picture on "Ulcers of the Stomach," a film on "Right Ileocolostomy for Cancer" were presented, and Dr. Edward Schons completed his lecture on "X-ray Therapy."

Dr. Joel Theodore Holcombe was elected a member.

A case of tuberculosis was reported among the school children in Marine-on-St. Croix. The patient had intimately exposed the other pupils in the school bus and also pupils in the school. Dr. E. A. Meyerding has requested that the school children be given the Mantoux test, that the positive reactors be x-rayed, and that all contacts be investigated.

Minneapolis Surgical Society

Meeting of October 1, 1942

President, Richard R. Cranmer, M.D., in the Chair
Secretary, R. F. McGandy, M.D.

HYPERPARATHYROIDISM—CASE REPORT

CARL O. RICE, M.D.

UNUSUAL LESIONS OF THE NECK

MARTIN NORDLAND, M.D.

BULLET WOUND INVOLVING THE TRACHEA, ESOPHAGUS AND PLEURA

THOMAS KINSELLA, M.D.

SOME PROBLEMS IN THE PRE-OPERATIVE AND POSTOPERATIVE CARE OF PATIENTS WITH HYPERTHYROIDISM

Experience in the Treatment of Goiter at the University of Minnesota Hospitals

CHARLES E. REA, M.D.
Saint Paul, Minnesota

There are few diseases in which careful pre- and postoperative care are so necessary as in hyperthyroidism. The importance of mental and physical rest through controlled environment and drugs, high caloric intake, and the judicious use of iodine therapy in the form of Lugol's solution is well recognized. The surgeon's care and skill at operation and attention to the postoperative care means the difference between a smooth and a stormy convalescence.

In spite of excellent care, there are some patients with hyperthyroidism who do not respond well to preoperative therapy. In spite of varying the amount of rest, diet, sedation, Lugol's solution or thiamine chloride, these patients may have a persistently high basal metabolic rate or pulse; their weight is stationary, and, try as they may, they never attain a physical or mental calmness.

Of all the components of preoperative treatment of patients with severe hyperthyroidism, there is none so abused as the use of Lugol solution. When iodine first came into general use in the early '20's, the answer to the goiter problem was thought to be found. However, this has proven not to be the case in the ensuing years. Empirically, one gives five to ten drops of Lugol's solution three times daily to patients with hyperthyroidism. One should never give Lugol's solution for more than two-week periods without evaluating the clinical status of the patient. The practice of giving Lugol's solution for months to goiter patients is to be condemned, as it is not only unnecessary but also it may confuse the clinical picture.

Patients whose clinical condition does not improve in spite of Lugol's solution (iodine fast) are often improved by attention to rest, diet, sedation, or thiamine chloride. In six iodine-fast patients with goiter the use of diiodotyrosine gave no more benefit than that obtained with Lugol's solution.

The practice of treating children or adults with mild hyperthyroidism with small doses of iodine over a long period of time has been advocated by some clinicians. In our opinion this is a dangerous form of therapy for the reasons mentioned above, and it puts a big responsibility on the physician prescribing the treatment. Thyroidectomy is a safer and surer method of treatment. It is our policy to be more conservative with children developing mild degrees of hyperthyroidism about the time of puberty. Two instances of mild exophthalmic goiter in children have come to our attention, in which spontaneous remission of symptoms after puberty occurred. Older children with hyperthyroidism have been subjected to thyroidectomy similar to that in adults.

At this clinic Lugol's solution is given to patients with hyperplastic goiters and also to those with nodular goiters with hyperthyroidism, both pre- and postoperatively. In our experience it is not necessary to give iodine medication patients with nodular goiter without hyperthyroidism, either before or after operation. Rather disturbing, however, is the fact that of 155 patients with "nontoxic adenoma of the thyroid," operated upon at the University of Minnesota Hospitals between the years of 1933 and 1940, who had not received Lugol's preoperatively, three showed degrees of thyroid storm postoperatively. These were probably cases of latent hyperthyroidism, not diagnosed clinically. For this reason, it is the author's personal opinion that it does no harm to give the majority of patients with nontoxic adenomata of the thyroid Lugol's solution before operation. The question of what percentage of nodular goiters without hyperthyroidism will be made toxic by the use of iodine is important (so-called Jodbasedow). It is said that in Kocher's clinic the use of iodine for sterilizing the skin in goiter operations was forbidden. Kocher's successor, deQuervain, listed thirty-three cases of Jodbasedow in nine years. However, Dr. Carl Rice, at the goiter clinic at the University of Minnesota Hospitals, has purposely treated cases of nodular goiter without hyperthyroidism with low doses of Lugol's solution (one to two drops a day) up to a period of two years, and has not seen a case that was made toxic by the iodine medication. Further, there are no statistical studies to show that there are more cases of toxic goiter developing among persons who took iodine for nodular goiter than among goiterous persons who did not take iodine (McClenden). It is the author's opinion that some instances of Jodbasedow are really cases of latent hyperthyroidism, flared up by stimuli other than the iodine. The

hole question of Jodbasedow merits a complete and ritical re-investigation before definite conclusions are arranted, however.

Some patients with persistently toxic goiter have een treated by means of deep x-ray therapy. There s no question but that selected cases of hyperplastic oiter can be successfully treated by this method alone. t is this author's opinion, however, that it is best used nly as a temporary method until the patient's condi- on permits surgical removal of the gland. There re some objections to the use of irradiation therapy n cases of hyperplastic goiter.

1. As compared to surgical removal, radiation ther- py takes a longer time to produce beneficial results.
2. Thyroid crisis may develop in patients with hyper- lastic goiter during a course of deep x-ray therapy.
3. It is of little value in the treatment of toxic odular goiter.
4. In comparable cases, the end results of irradiation herapy do not equal those obtained with surgery.

In patients with severe hyperthyroidism, one may ear to do even stage operations to remove the goiter. n 1935, the procedure, suggested by Miles Porter, of njecting boiling water into the thyroid gland in order o destroy its substance was carried out upon eight atients. Our impression is that it is at best a good orm of psychotherapy. For one thing, it is question- ble whether "boiling" water is actually injected into he thyroid gland. While the water may be so hot that he surgeon can hardly hold the syringe in his hands ith cotton gloves, one can touch the needle through hich the water is injected without undue discomfort. lso, except for some areas of hemorrhage, the micro- copic studies of the thyroid gland subsequently re- oved did not show marked fibrosis or parenchymal estruction. The procedure has some merit in that it ccustoms the patient to the operating room.

Ligation of the superior thyroid vessels is often sug- ested as a preliminary treatment of severe thyrotoxic atients. It is becoming less and less popular as a form f therapy at this clinic; in fact, it has not been per- ormed as a stage procedure here in the last two years. n the opinion of this author, there are several unsatis- actory aspects of polar ligation:

1. In order to carry out a ligation of the superior hyroid artery properly, the vessels should be ligated here they come off the external carotid artery. It is he author's opinion that too often just branches of the uperior thyroid vessels are ligated.
2. It often takes more time and is more of a strain n the patient than the surgeon realizes. There is at ast one instance of thyroid storm following polar gation at this clinic.
3. Reference to the records available in six polar gations done at this hospital within the last seven ears shows that the results are questionable as far as nprovement in the blood pressure, pulse and general ondition of the patient is concerned.

The following factors should be taken into considera- ion before operating on the thyroid gland: the pa- ent's age, the size of the gland, the response to Lugol's olution, the duration of the hyperthyroidism, the basal metabolism rate, the pulse, the gain in weight and the patient's general physical and mental condition. The procedure to be used should be decided in the surgeon's mind in the patient's room *before* operation and not at the operating table. If, from an evaluation of the patient's condition, just a ligation of the superior poles of the thyroid gland or a lobectomy is agreed upon, it is inviting disaster to proceed further just because the patient stood the stage procedure well. Moreover, if the patient begins to react badly while the surgeon is doing the procedure contemplated before operation, it is best to do the minimum and, if the operation has not gone too far, to close the wound as quickly as possible. The three fatalities that have occurred in this clinic during the past two years in thyroid patients (out of a total of 286 operations) have been due to failure to observe one or both of these two rules.

Since the whole rationale of thyroidectomy in hyperthyroidism is to shift the patient from a state of hyperthyroidism to one of hypothyroidism, hoping to hit a happy medium, one can realize how much the experience of the surgeon counts in judging how much of a thyroid should be removed. In severe thyrotoxic patients, one aims to do a bilateral subtotal thyroidectomy in one or more stages. It is interesting to note how the stage procedure has passed from one of necessity to one of election. At this clinic, a unilateral lobectomy is the stage procedure of choice in the severe thyrotoxic patient. A right subtotal lobectomy is usually performed first, with surgical removal of the left side being deferred until two to four weeks later. The use of local, general inhalation or intravenous anesthesia, or combinations of these, depends somewhat on the choice and temperament of the surgeon. Ether is a bad anesthetic for thyrotoxic patients, as it tends to produce pulmonary edema. Cyclopropane has been used as the chief inhalation anesthetic at this clinic, but is contraindicated if the patient has cardiac irregularity. Its chief value lies in the high oxygen content of the mixture.

At the University Hospitals the use of intravenous pentothal ("Sneak thyroidectomy") has proven of value in patients with toxic goiter. The procedure is as follows: For two or three days before operation the patient is given 1000 c.c. of 5 per cent glucose in saline intravenously. Since operations are performed in the afternoon at this hospital, the patient is given a liquid breakfast on the day of operation and intravenous glucose solution. No other preparation is made, so that the patient is unaware that he is to be operated upon that day. Just before operation, when the infusion has just about been completed, intravenous pentothal is given through the same infusion needle. The sleeping patient is taken to the operating room where the neck is prepared for operation and inhalation anesthesia is initiated. Even though intravenous pentothal and inhalation anesthesia have been used, some patients with severe hyperthyroidism have had degrees of thyroid storm postoperatively. To prevent such an occurrence, spinal anesthesia in the operative management of severe hyperthyroidism has been used. This

idea was suggested from the good result following the use of a spinal anesthetic in a case of thyroid crisis. The case report of the patient with thyroid crisis treated with spinal anesthesia is as follows:

The patient was a white, married woman, forty years old, who had had symptoms of hyperthyroidism for eight months. She had lost thirty-five pounds in weight in that time, was nervous, irritable, and had noticed a slight exophthalmos. Her appetite was excessive and her palms were always moist with perspiration.

Examination of the thyroid revealed a diffusely enlarged gland. There was slight exophthalmos. Her blood pressure was 140/180. Three basal metabolic rates had been plus 53, plus 32 and plus 20 per cent, while receiving Lugol's solution and sedation for one month. The pulse dropped from 120 to 90 during this time. Examination of the urine was negative. The hemoglobin was 65 per cent with 3,500,000 erythrocytes.

On May 13, 1941, a bilateral subtotal lobectomy was performed. The patient seemed to stand the procedure well, but that evening the pulse rose to 140 per minute, the blood pressure 170/90, respiration 32 per minute and temperature 103.6 (rectal). She was restless and somewhat confused mentally. In the ten-hour period since operation she had been given 2500 c.c. of 5 per cent glucose in normal saline, two doses of morphine sulfate, gr. ¼, two doses of nembutal, gr. III, 15 gr. of sodium iodide intravenously, 60 minims of Lugol's solution in 200 c.c. of tap water by proctoclysis.

When the author saw her in consultation about twelve hours after her operation, there was no question but that she had a thyroid crisis. The attending surgeon had tried everything that is usually given for this condition. It was decided to try to increase the sedation and also to give a blood transfusion. The next morning the patient was very restless and irrational. The nurse said that nembutal, gr. III every two hours for three doses, failed to quiet her. The patient's temperature was 104.6 (rectal), pulse 160 per minute, blood pressure 180/110, respiration 45 per minute and the patient looked as if she were going to die unless some relief were given shortly. It was then decided to try spinal anesthesia. Sixty milligrams of procaine hydrochloride (novocaine crystals) were given intraspinally in the third lumbar space. Anesthesia was obtained to about the fourth rib anteriorily, but it was not complete, as the patient could still move her legs after the anesthesia was given. The effect on the blood pressure, pulse, respiration and temperature was dramatic. The blood pressure fell almost immediately (shock-like phenomena?), the pulse and respiration became slower, and the temperature was 100° about three hours later. The patient immediately became quieter and went to sleep. This was somewhat disturbing at first, but since the blood pressure was maintained above shock level, no great concern was felt. The anesthesia wore off in about one and a half hours. Following this the patient was given phenobarbital, gr. I, t.i.d., and Lugol's solution gt. XV, t.i.d., and 3000 c.c. of 5 per cent glucose, half in saline and half in triple distilled water, every twenty-four hours for three days. Twenty-four hours after the anesthesia, the blood pressure and pulse rose temporarily, but this was apparently controlled by nembutal, gr. III. The patient made an uneventful recovery and was discharged on the fourteenth postoperative day. When seen six weeks later, she said she felt better, had gained ten pounds, less nervous and irritable. Her basal metabolism rate was plus 12 per cent, pulse 90 per minute.

A review of thyroid crisis is beyond the scope of this paper, but it will be mentioned here as it has bearing on what will be discussed later. The disturbing fea ture in the treatment of thyroid crisis or storm is tha there is no specific therapy known to date. Funda mentally, the cause of this condition is still obscur It is not certain whether the primary difficulty lies i the thyroid gland itself or whether other organs such as the adrenal, liver, pituitary, etc., are th site of the disorder. If the primary organ at faul is the thyroid gland, it is unknown whether the symp toms are due to an excess of normal secretion or t an abnormal secretion. Crile seems to believe that th adrenals are at fault in thyroid crisis. Maddock, Colle and Pederson have found "adrenalin" in the peripher venous blood of some patients with reactions to hyper thyroidism, the quantities found suggesting a direc relationship to the severity of the reaction. Lahey state that in his opinion "most thyroid deaths are largely live deaths." The results of the thorough review by Foss Hunt and McMillan showed that neither the heart, liver thyroid nor thymus alone seemed to be at fault in thyroi crisis. In their opinion there was no proof that thyroi crisis followed sudden hypersecretion of thyroxine epinephrine or both. Good summaries of the presen concepts of thyroid crises are given by Foss, Hunt an McMillan and also by Pemberton. One reason why postoperative crisis, in association with typical exoph thalmic goiter is now uncommon, is that these patient are given careful postoperative care.

Postoperatively, it is important to watch the bloo pressure, pulse, respiration and temperature, because i they begin to rise, one should suspect a thyroid storm or crisis. When a thyroid crisis begins or seems immi nent, the therapy consists of the judicious administratio of sedation; iodine medication by vein, mouth or rectum oxygen therapy, intravenous glucose and fluid; col compresses, etc. Occasionally blood transfusions hav been given. It would be interesting to see what effec transfusions of blood from patients with myxedem would have on patients with a thyroid storm.

Occasionally, however, in spite of the above measures the patient does not improve. In such instances, the use of spinal anesthesia might be considered. Crile has reported beneficial results following spinal anesthesia in a few cases of thyroid crisis. Bartels, Stuart and Johnson tried it in one case. While the immediate clinical improvement was striking, the patient subsequently died. The procedure is not irrational, on the basis that spinal anesthesia temporarily denervates the adrenal glands.

To date, spinal anesthetic has been used in three cases of thyroid crisis with good result at this clinic.

Because of the good results following the use of spinal anesthesia in cases of thyroid crises, it was suggested that spinal anesthesia might be used as a preoperative measure in cases of severe hyperthyroidism. The first case so treated is given in detail because when operation was first attempted, without the spinal anesthetic (control), the patient had a severe reaction on the table.

C. G., aged forty-one years, was admitted to the University of Minnesota Hospitals on October 11, 1941. He gave a history of dyspnea, and fatiguability since

the winter of 1940-41. Rather marked irritability had been noted by his wife about eight months previously. He noticed a mass in his neck and pounding of the heart approximately three months prior to admission. In spite of an increased appetite, he had lost thirty-five pounds in the past year. He had noticed tremor of the hands for approximately two years.

On admission, the patient's temperature was 98.8, pulse 100, respiration 20, blood pressure 138/60.

Physical examination revealed a well-nourished, well-developed white male who was rather hyperactive. There was a mild exophthalmos of both eyes. The thyroid gland was diffusely enlarged and firm. No bruit was heard. The heart was of normal size and the tone was forceful. No murmurs were heard. The lungs were clear to auscultation and percussion. There were no abdominal masses. There was a fine tremor of both hands. There was a staring impression of the eyes and definite lid lag was present.

The patient had received Lugol's solution, ten drops three times a day, since September 28, 1941. He had also been given phenobarbital, gr. 1ss three times a day and thiamine chloride, one milligram four times a day. Some difficulty was experienced in raising his caloric intake sufficiently, but with a 5200 caloric, high carbohydrate, high protein diet, his hunger was relieved and he began to gain weight. His basal metabolic rate on September 18, 1941, was plus 84 per cent; on October 2, 1941, plus 74 per cent; and on October 12, 1941, plus 51 per cent. The basal metabolic rate never went below this level at any subsequent test. His pulse rate was not excessive and consequently it was thought that lobectomy should be attempted.

He was taken to the operating room on October 28, 1941. Pentothal was given intravenously in his room and he was taken asleep to the operating room, where inhalation cyclopropane anesthesia was instituted. At the beginning of the operation the blood pressure was 140/80 and the pulse 120 per minute. After making the skin incision in the neck, his blood pressure was 180/90, but the pulse was still 120 per minute. On cutting through the platysma muscle and retracting the strap muscles of the neck, the blood pressure was found to be 220/100 and the pulse 160. Some of this untoward reaction was thought to be due to the cyclopropane, so this anesthetic was discontinued and only oxygen given. However, as the patient did not improve, the skin incision was closed and the patient transferred back to his room.

Postoperatively the patient had quite a stormy time for the first few postoperative days. Because of this reaction, it was decided to give the patient a course of deep x-ray therapy to the thyroid gland; he received 500 r/air to the anterior thyroid region and 250 r/air to the right and left lateral thyroid areas over a period of nine days from November, 1941, to November 14, 1941. His basal metabolic rate on November 7, 1941, was plus 53 per cent. The patient became somewhat restless and did not seem to acquire a mental and physical calmness during this time. On November 17, 1941, the patient was taken to the operating room again. Anesthesia was induced with intravenous pentothal sodium in the patient's room. In the operating room, 75 mg. of procaine hydrochloride was given intraspinally in the third lumbar interspace. Anesthesia, as determined by pinching the skin with a Backhaus forceps was obtained to the third intercostal space. Inhalation ethylene anesthesia was then given and a bilateral subtotal thyroidectomy performed.

The patient had a surprisingly smooth operative course: The blood pressure was maintained at about 140/80 and the pulse between 100 and 120. Postoperatively, the patient's condition was good and, except for a hematoma in the wound, his course was uneventful. He was discharged on November 30, 1941, with instructions to report for checkup to the out-patient clinic. When seen on January 16, 1942, his basal metabolic rate was plus 35 per cent, his weight was 215 pounds, and he looked and felt well. On April 16, 1942, his basal metabolic rate was plus 12 per cent, his weight 220 pounds and he was doing moderately heavy work.

To date, we have operated upon twelve patients with severe hyperthyroidism using a combination of intravenous pentothal, spinal and inhalation anesthesia. Under this regimen we have been able to do bilateral subtotal thyroidectomy upon patients who heretofore we would have only done stage procedures. The basal metabolic rate in these patients before operation was never lower than 40 per cent. We have been impressed with the smooth operative and postoperative course in these cases.

The whole purpose of the spinal anesthesia as used in these cases is to inhibit medullary adrenal releases during the operation, which would forestall the occurrence of an immediate severe postoperative reaction. It is not the intent to secure anesthesia to a level (second to fourth cervical segment) which would permit the operation being done under this agency alone. The question comes up, of course, how do we know that the adrenals are so important in thyroid storm. We believe that the adrenals are important first because of the reactions accompanying the so-called Goetsch test. In this test, if adrenalin is given intravenously to patients with mild or latent hyperthyroidism the patient gets a reaction akin to a thyroid strom. Secondly, we have examined the blood sugar of these patients before, during, and after thyroidectomy and have found that the blood sugars are not elevated. If there were signs of hyperadrenalism, one would expect an increase in the blood sugar. Certainly, when spinal anesthesias have not been used upon the patients operated upon with either general anesthesia or pentothal, we have observed an increase in the blood sugar. As yet, we have made no determinations of the amount of adrenalin in the blood during these operations (Whitehorn test).

It is important that a somatic analgesia to about the fourth dorsal segment be derived from the use of spinal anesthesia, if one hopes to inhibit the splanchnic nerves to the adrenal glands. We have checked the anesthesia by noticing when the patient gives evidence of pain by pinching the skin of the chest at different levels. It is to be emphasized that it is not necessary to use a spinal anesthetic in all thyrotoxic cases. It is not the purpose of this paper to recommend the use of spinal anesthesia in the routine treatment of thyroid crisis. In fact, there are several objections that might be voiced against its use: (1) spinal anesthesia is not a harmless form of therapy in itself and its use in an ill patient is not without danger; (2) there is no definite proof that the adrenal glands are primarily at fault in thyroid crisis; (3) the post hoc ergo propter hoc type of reasoning is dangerous, especially when other medications are used; and (4) thyroid crisis may cure itself spontaneously.

On the other hand, the whole treatment of thyroid crisis is symptomatic and until a specific cause and

treatment for the condition is known, the therapy will be rather empirical. It would seem justified to use spinal anesthesia in selected cases when the usual methods of treatment of severe thyroid crisis have failed.

Certainly its use in the operative treatment of severe hyperthyroidism would seem justified and the risk seems less than it would be if one attempted to do the same operation without the spinal anesthetic. The patients must be carefully selected, however, and wholesale application of the method certainly is not warranted.

Summary

Some impressions concerning the treatment of goiters at the University of Minnesota Hospitals have been reviewed. A plea for a more rational use of Lugol's solution is made. In the patient with severe hyperthyroidism, who does not respond well to preoperative therapy, the use of deep x-ray or thyroidectomy in stages has been unsually carried out.

We have been impressed with the use of spinal anesthesia as an adjunct to the operative and postoperative management of severe hyperthyroidism. The basis of the proposal is predicated on the thesis that an effective spinal anesthesia, which would inhibit medullary adrenal releases during the operation, would help to forestall the occurrence of immediate severe postoperative reactions. It is not the intent to secure anesthesia to a level (second to fourth cervical segment) which would permit the operation being done under this agency alone. On the contrary, a somatic analgesia to about the fourth dorsal segment is derived with the use of spinal anesthesia, the analgesic for the performance of the operation upon the neck being obtained with the use of other agents—usually a combination of pentothal and cyclopropane. The idea is rational and feasible; further investigation is necessary to determine how valid the premises are.

References

1. Bartels, E. C., Stuart, C. K. and Johnson, E. C.: The adrenal gland in hyperthyroidism. Trans. Am. Assn. for Study of Goiter, p. 133, 1940.
2. Crile, G., Jr.: Management of the Patient with hyperthyroidism: preoperative and postoperative care. Surg. Clin. No. Am., 16:1051, 1936.
3. Fiske, F. A.: Thyroid crisis as a postoperative complication. Trans. Am. Therap. Soc., p. 133, 1931-40.
4. Foss, H. L., Hunt, H. F., and McMillan, R. M.: The pathogenesis of crisis anl death in hyperthyroidism. Jour. A.M.A., 113:1090, (Sept. 16) 1939.
5. McClendon, J. F.: Iodine and the incidence of goiter. pp 95-96, Minneapolis: University of Minn. Press, 1939.
6. McGregor, J. K.: Hyperthyroid crisis. West. Jour. Surg. Obst. and Gynec., 49:367, 1941.
7. Maddock, W. G., Coller, F. A. and Pedersen, S.: Thyroid crisis: its relation to liver function and adrenalin. Trans. Am. Assn. for Study of Goiter, p. 61, 1936.
8. Pemberton, J. de J.: Reactions following operation for hyperthyroidism. Ann. Surg., 104:507, 1936.
9. Werner, A. A.: Endocrinology, clinical application and treatment. p. 491. Philadelphia: Lea and Febiger, 1937.

Discussion

Dr. Ralph T. Knight: Dr. Rea is to be greatly congratulated upon his willingness and courage to consider spinal anesthesia as a method of management for the acute situations in hyperthyroidism, especially with so little recorded experience to be found in the literature. The soundness of the theory led him to use it as a last resort in the cast of postoperative storm which he has related.

I was startled when he first came to me asking for spinal anesthesia for a case to be immediately operated. I wondered if he had come under the spell of a certain surgeon who has reported a good many thyroidectomies under high spinal anesthesia. His explanation and his description of the above case made me anxious to go along with him. Dr. Rea has described to you the first case that he operated under this management, namely, pentothal induction in bed, spinal anesthesia upon reaching the operating room, maintenance of general anesthesia with one of the gases. The patient came through the operation with no reaction. This was in contrast to a previous attempt when the operation was abandoned because the pulse and blood pressure had risen to such alarming heights by the time the incision was made.

As an example of the use of a spinal anesthesia in the treatment of thyroid crisis, I was especially impressed by the case of a sixteen-year-old girl who had had thyroidectomy for hyperthyroidism. After being home a few days she came into the hospital with a pulse rate of 160; blood pressure, systolic 180, diastolic 90; eyes, very alert and yet rather glassy; mien apprehensive. We gave her spinal anesthesia in bed as her only treatment. In twenty minutes her pulse began to slow down and her blood pressure to decline. In thirty-five minutes she was an entirely different girl with pulse rate 80, blood pressure 125 systolic, 75 diastolic; she was calm and natural, said she wanted to sleep and did so.

The anesthesia must be planned so as to reach the fifth dorsal segment in order to block the sympathetic nerve supply to the suprarenals. We have used only procaine in these cases. The dose has varied from 80 to 120 milligrams. I see no reason why the higher dose should not be used. The head of the table may be tilted downward 10 degrees for a few minutes to assure high enough anesthesia. In so doing the patient's head should be raised on a pillow to prevent the anesthesia from extending to the cervical segments.

In these cases we have not used any pressor drugs to prevent or treat falling pressure. Blood sugar estimates were made before, during and after the spinal anesthesia to help estimate the changes in suprarenal function and we did not want to cloud this picture. In two instances the blood pressure fell rather alarmingly during operation. This was treated by Trendelenburgh position and intravenous fluid and responded fairly satisfactorily.

I wish that the term "shock" would not be used to describe the fall of blood pressure under spinal anesthesia. The mechanism is entirely different from shock. In true shock capillaries are dilated and permeable but small vessels are in spasm. Vasoconstrictor drugs are contraindicated but fluids, serum and blood should be used in proper proportion. In spinal anesthesia small vessels are dilated rather than constricted and vasoconstrictor drugs can well be used to restore the normal condition.

I believe that after informative data have been gathered in regard to blood sugar and other evidences of changes in suprarenal function, it will be well to use careful doses of ephedrine or neosynephrin as indicated to keep the blood pressure under control while using spinal anesthesia in the emergency management of extremely hyperthyroid patients.

Dr. Rea has really opened up an extremely important field in therapeutics.

Dr. C. E. Merkert: I wish to ask about the possibilities of doing a paraspinal sympathetic block to cut off the adrenal stimulation in place of the spinal anesthesia in these severe goiter cases. Is pentothal better than avertin for inducing anesthesia in the thyroid patient?

(Continued on Page 576)

PYOKTANIN SURGICAL GUT

Plain and Formalized

Manufactured Since 1899 by

The Laboratory of the Ramsey County Medical Society

Packaged dry in hermetically sealed glass tubes in accordance with the new requirements of the U. S. Pharmacopœia.

• • •

Price List

PLAIN TYPE A NONBOILABLE
AND
FORMALIZED TYPE C NONBOILABLE

Sizes.....000 — 00 — 0 — 1 — 2 — 3
28 inches.....per dozen strands $2.00
60 inches.....per dozen strands $3.00

Special discount to hospitals and to the trade. Cash must accompany the order.

• • •

Address

LABORATORY RAMSEY COUNTY MEDICAL SOCIETY

Lowry Medical Arts Building, St. Paul, Minnesota

FOR SALE BY SURGICAL DEALERS AND DRUGGISTS



(Continued from Page 574)

DR. KNIGHT: For this purpose it is necessary to block the sympathetics as high as the fifth thoracic segment. Thoracic sympathetic block is more difficult and carries more risk than lumbar sympathetic block. I believe for this purpose it is better and more simply accomplished by spinal, that is, subarachnoid anesthesia.

I personally prefer pentothal to avertin. The dose can be much more accurately administered with much less fuss and bother. In some places avertin is almost routinely used as preanesthetic medication.

DR. T. H. SWEETSER: What about the volume of spinal fluid and the drug used?

DR. KNIGHT: This question brings up the discussion of spinal anesthesia in general which I did not mean to enter. For these cases, we have used procaine exclusively. The dose has been up to 120 milligrams. Enough spinal fluid should be added to dilute the solution to 5 per cent or even 4 per cent. Stronger solutions should never be injected. Seven per cent results in a small but definite incidence of prolonged or permanent effect upon the nerve tissue. With still stronger solutions the incidence increases. Injection should be made at a rate not less than 1 c.c. per second so as to spread the solution immediately into the spinal fluid. Slower injection encourages the layering of the solution under the spinal fluid, thus subjecting nerve roots to too strong a solution.

For other purposes of spinal anesthesia we use almost all of the preparations available except spinocaine. We use nupercaine, pontacaine, metycaine and procaine, according to the characteristics of the drug. We use procaine and metycaine never stronger than 0.5 per cent; nupercaine never stronger than 1-1500. Any of them may be injected rapidly without harm but none should be injected slowly.

DR. REA (closing): In regard to Dr. Nordland's discussion, I am not exactly sure how the spinal anesthesia works as part of the operative plan in the treatment of severe hyperthyroidism. It is logical to believe that it knocks out the sympathetic innervation to the adrenal glands. We have removed some goiters entirely under pentothal anesthesia, but the operative and postoperative course has not been as impressive as when spinal anesthesia is also used. I can recall no instance of thyroid crises postoperatively since we have used the above operative plan. I think all of us have been impressed with how smooth the operative and postoperative course is in these patients in which we use a combination of intravenous, spinal, and inhalation anesthesias. Instead of stage procedures, we can do bilateral subtotal thyroidectomy at one operation. Some of the patients are out of bed on the second day. Michel clips are removed, half on the third day and the remaining on the fourth day. Most of the patients go home on the fifth and sixth day.

ZEMMER

PRESCRIBE or DISPENSE ZEMMER PHARMACEUTICALS

Tablets, Lozenges, Ampoules, Capsules, Ointments, etc. Guaranteed reliable potency.

Our products are laboratory controlled. Write for catalogue. *Chemists to the Medical Profession* MIN 6-43

THE ZEMMER COMPANY ★ OAKLAND STATION ★ PITTSBURGH, PENNSYLVANIA

WOMAN'S AUXILIARY

MRS. RAYMOND J. JOSEWSKI, *President*
Stillwater, Minnesota
MRS. W. H. RUCKER, *Publicity Chairman*
Minneapolis, Minnesota

Goodhue County

Mrs. E. M. Baldigo, secretary of Goodhue County Medical Auxiliary, sends in a most interesting résumé of her organization's activities during the past year. Mrs. Aanes, of Red Wing, as president, has led the group in a program which included Red Cross knitting, nutrition classes and Round Robin letters to service men's wives. Congratulations on a good year's work.

Hennepin County

The annual meeting of the Hennepin County Medical Auxiliary was held May 7 at a luncheon meeting at 10 Groveland. Mrs. J. M. Hall, vice president, presided in the absence of Mrs. James A. Johnson, president. Annual reports from committee chairmen were given, highlights among these being the work of Mrs. Funstead's group at the War Bond Booth in the Medical Arts Lobby, and the benefit party which netted well over three hundred dollars.

Mrs. Harold Wahlquist was welcomed in as president for the coming year and Mrs. J. M. Hall as president-elect. Other officers elected were:

First Vice President.....Mrs. H. W. Quist
Second Vice President.....Mrs. T. J. Kinsella
Treasurer .....Mrs. F. L. Bryant
Recording Secretary.....Mrs. L. W. Fink
Corresponding Secretary.....Mrs. E. O. Dahl

The auxiliary was very happy to have as special guests to the luncheon, our State President, Mrs. R. J. Josewski of Stillwater, and our Finance Chairman, Mrs. J. Dordal of Sacred Heart.

Park Region

On April 28 the Park Region Medical Auxiliary members had dinner with their husbands at the River Inn.

Following the dinner auxiliary members were guests of Mrs. O. V. Johnson at her house.

The annual business meeting was conducted by the president, Mrs. A. J. Lewis. The following officers were elected:

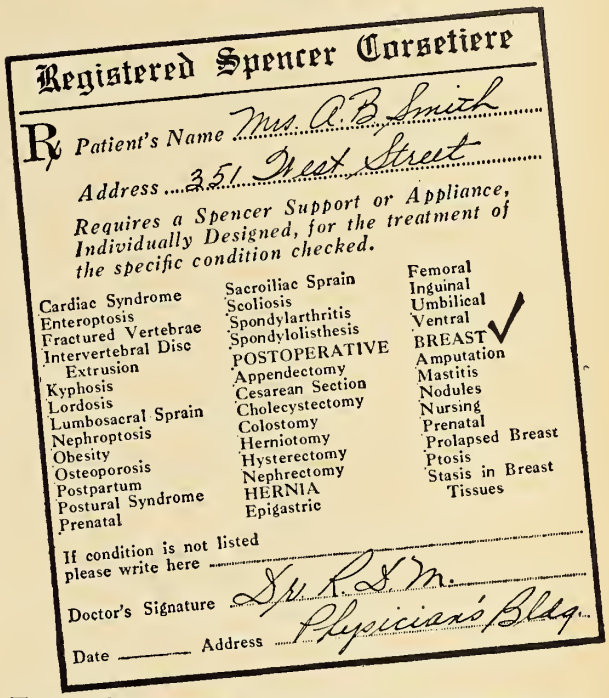
President .....Mrs. A. J. Lewis
Vice President.....Mrs. Frank Naegeli
Secretary .....Mrs. W. O. B. Nelson
Treasurer .....Mrs. Peter Boysen

Southwestern Minnesota

Mrs. R. J. Josewski, state president, shared honors with Dr. Stephen H. Baxter of Minneapolis, president of the Minnesota State Medical Association, at a dinner given in the Thompson Hotel in Worthington, Minnesota, on Tuesday, April 27, by Southwestern Minnesota Medical Society.

After the dinner, the auxiliary members were guests at the home of Dr. and Mrs. B. O. Mork, Jr., where the business meeting followed.

HAVE YOU PATIENTS WITH ANY OF THESE CONDITIONS?



Every Spencer is individually designed, cut and made to meet the needs of the one patient who is to wear it. All Spencers are light, flexible, comfortable, easily laundered—durable. Each Spencer is designed to improve the posture of the patient and to meet your specific requirements. The Spencer Corsetiere personally delivers to the patient the support you prescribe, adjusts it, and keeps in touch with patient to make certain that satisfaction is permanent. This saves the doctor from complaints of patients regarding fit or comfort.

Spencer Supports are never sold in stores. For a Spencer Specialist, look in telephone book under "Spencer Corsetiere" or write direct to us.

SPENCER *INDIVIDUALLY DESIGNED*

Abdominal, Back and Breast Supports

SPENCER INCORPORATED,
137 Derby Ave., New Haven, Conn.
In Canada: Rock Island, Quebec.
In England: Spencer (Banbury) Ltd., Banbury, Oxon.

May We Send You Booklet?

Please send me booklet, "How Spencer Supports Aid the Doctor's Treatment."

.....M. D.

Address O-6

BROWN & DAY INC. SAINT PAUL U.S.A. SERVICE QUALITY

REMEMBER—

our complete line of trusses, supporters, and elastic wear when you next prescribe these appliances. We are also equipped to provide orthopedic braces.

A registered nurse and an experienced fitter supervise the department.

BROWN & DAY, Inc.

St. Paul, Minnesota

Stearns-Benton Counties

Annual reports were made at the dinner meeting o Stearns-Benton Medical Auxiliary in May. Thes reports showed a successful year under the leadershi of Mrs. R. N. Jones despite the added burden o wartime restrictions.

Among the many activities undertaken was the hos pital project which the auxiliary has sponsored over period of many years. The sum of $50 is contribute annually. There is a rummage sale, and a layett project which is ready for any emergency, in charg of Mrs. Julian Buscher.

Many hours were devoted by auxiliary members t Victory Aides, home nursing, first aid, surgical dress ings.

A sum of money was contributed to the Victor book campaign and a war bond was purchased durin the April drive.

Five dollars was voted by the auxiliary to the Servic Men's canteen.

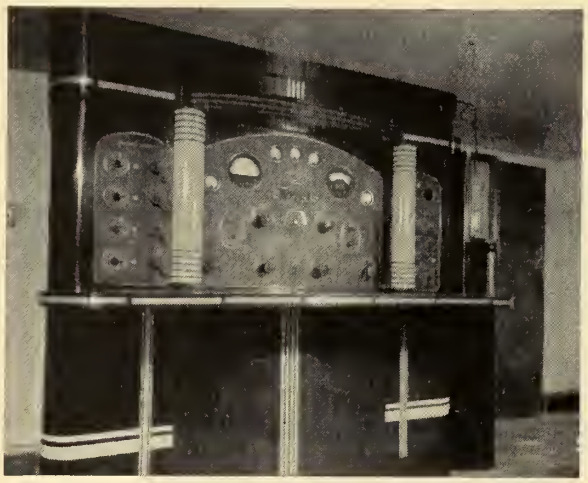
Officers were re-elected as follows:

President	Mrs. R. N. Jones
Vice-President	Mrs. William Friesleben
Recording Secretary	Mrs. J. J. Gelz
Treasurer	Mrs. T. W. Hovorka
Corresponding Secretary	Mrs. T. M. Fleming
Auditor	Mrs. J. B. Beuning

Washington County

Washington County Medical Auxiliary had a Dutch Treat dinner at White Pine Inn on Tuesday, April 13 A short business meeting followed.

Radiation Therapy Institute



Control Board

of Saint Paul

CHARLES T. MILLER HOSPITAL

Facilities for Radium and Roentgen Therapy, Including Million Volt Constant Potential Installation of Most Advanced Design.

You are cordially invited to visit the Radiation Therapy Institute and inspect its facilities

Edward Schons, M.D., *Director* J. P. Medelman, M.D., *Associate Director*

Of General Interest

Dr. and Mrs. R. F. Pierson of Slayton are the parents of a daughter, Marlys Sue, born April 5, 1943.

* * *

Dr. and Mrs. D. Kalinoff and daughter of Stillwater have returned from an extended tour of the southwestern part of the country.

* * *

Dr. J. S. Schrader, physician and surgeon in Springfield for more than thirty years, is now located in Lamberton.

* * *

Dr. and Mrs. M. M. Loucks have recently moved to Northome, where Dr. Loucks has established a practice. They formerly lived in Alvarado, Minnesota.

* * *

Dr. Gilbert Cottam, formerly of Minneapolis, has been appointed Superintendent of the South Dakota State Board of Health, with headquarters at Pierre.

* * *

Dr. R. Wynn Kearney of Mankato is attending Harvard Medical School for a course in surgery preparatory to reporting for active duty as a captain in the Medical Corps.

* * *

Dr. Edward A. Hackie of Hallock left his practice in April to serve in the Medical Corps as a lieutenant. He plans to return to Hallock after the war to resume his practice of medicine and surgery.

* * *

Dr. and Mrs. L. H. Hammar of Butterfield, with their two children, have moved to Two Harbors, where Dr. Hammar is a member of the clinic and of the medical staff of the Two Harbors Hospital.

* * *

Dr. N. N. Sonnesyn of Le Sueur reported for duty in the Medical Corps of the Army in May, with the commission of captain. At present he is at the Fitzsimons General Hospital in Denver, Colorado.

* * *

Dr. R. S. Madland of Fairfax left early in May for service in the Medical Corps of the Army, with the rank of captain. He will be stationed at the Army Hospital, Springfield, Missouri, following a training period at Carlyle Barracks, Pennsylvania.

* * *

With the departure of Dr. Ralph T. Edwards to Bigfork, Montana, the village of Elysian is without the services of a physician for the first time in many years. Dr. Edwards had practiced in Elysian for the past twenty-eight years.



The Birches Sanitarium, Inc.

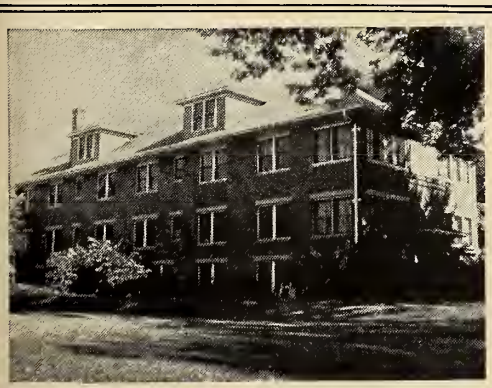
2391 Woodland Avenue

Duluth, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Psychiatrists in Charge

L. R. Gowan, M.D. **A. S. Nissen, M.D.**



VOCATIONAL HOSPITAL

. . . An integral part of the Miller Vocational High School offers two special features—Patients receive a maximum of personal attention from student practical nurses—All food is prepared under the direction of a qualified dietitian. Patients remain under the care of their own physicians.

Director of Nurses—M. H. WOLTMAN, R.N., B.S.
Superintendent & Dietitian—H. B. BROWN, B.S.

Physicians may secure services of Vocational nurses by calling Nurses Headquarters and asking for a Vocational Nurse

Bridgeport 2281

5511 South Lyndale - - Minneapolis

Dr. N. T. Norris of Caledonia has taken over the operation of the Caledonia Hospital, which will continue to be open to physicians and surgeons in the community for the treatment and care of their patients. Dr. Norris will also continue his association in practice with Dr. G. B. Belote.

* * *

Dr. A. A. Giroux, formerly of Moose Lake, has moved to Taylors Falls, where he has opened offices for the practice of medicine. Dr. Giroux will occupy the office of the late Dr. C. A. Kelly.

* * *

Dr. Ralph Rossen, superintendent of the Hastings State Hospital for the past five years, has left for Bethesda, Maryland, for active duty in the Navy. He has received his appointment as passed assistant surgeon with the rank of lieutenant, senior grade.

* * *

Dr. John Nelson Eubank, formerly associated in public health service at the state sanatorium at Ah-Gwah-Ching, will act as superintendent of Sand Beach Sanatorium at Lake Park during the absence of Dr. R. R. Hendrickson, on leave of absence in government work.

* * *

Dr. Henry Hutchinson, assistant superintendent of the Moose Lake State Hospital for the past five years, has been appointed superintendent of the Hastings State Hospital, to succeed Dr. Ralph Rossen, who has entered service as a lieutenant in the Navy. Dr. Hutchinson practiced in New London, Minnesota, before entering state service at the Willmar State Hospital.

* * *

Dr. H. C. Doms of Slayton and Dr. Thomas Lowe of South Saint Paul have been elected to active membership in the International College of Surgeons and will receive their degrees and diplomas of membership at the convocation of the United States Chapter of the College to be held in New York City, June 14, 15 and 16.

* * *

Dr. H. W. Sybilrud, physician and surgeon of Brice-lyn for the past twenty years, is now with the Marines in the South Pacific, serving as Commander. Commander Sybilrud, who is a veteran of World War I, volunteered for service in the U. S. Navy in February, 1941. He received his promotion from lieutenant-commander to commander last July.

* * *

Lieutenant Colonel W. J. Eklund, Duluth surgeon, has been appointed base surgeon of an overseas command with several posts under his jurisdiction. During World War I, Colonel Eklund served with the American Expeditionary Forces in France as a first lieutenant in the Medical Corps. He participated in the Louisiana maneuvers last year as regimental surgeon in

WAUKESHA SPRINGS SANITARIUM



BUILDING ABSOLUTELY FIREPROOF

FOR THE CARE AND TREATMENT OF

NERVOUS DISEASES

BYRON M. CAPLES, M. D., Medical Director
FLOYD W. APLIN, M. D.
WAUKESHA, WIS.

DANIELSON MEDICAL ARTS PHARMACY, INC.

PHONES:
ATLANTIC 3317
ATLANTIC 3318

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

HOURS:
WEEK DAYS—8 to 7
SUN. AND HOL.—10 TO 1

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.
414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.
INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS
MAIN 2494

e 125th field artillery, 34th division, and later was signed to a post in Boston. He was later stationed on overnors Island, New York, for two months before ing ordered to overseas duty. His son, Corporal obert D. Eklund, is serving with the American Rang- s in Africa.

* * *

Dr. R. R. Hendrickson of Lake Park has been anted a three years' leave of absence by the com- ission of Sand Beach Sanatorium to enter govern- ent service with the United States Public Health ervice. Following a period of training in Washington, . C., Dr. Hendrickson will be stationed in Juneau, laska. He has been commissioned a surgeon, which comparable in rank to major in the military service.

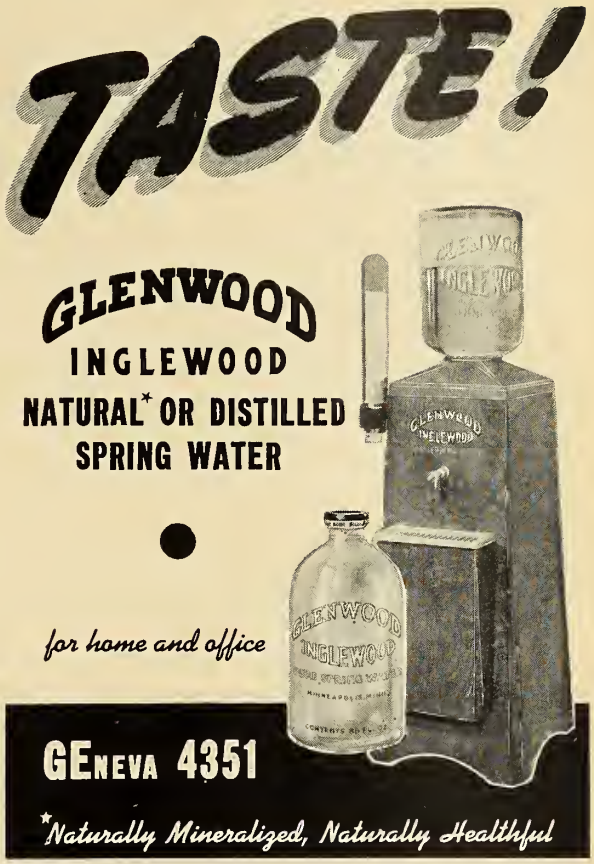
* * *

Dr. B. R. Kirklin, director of the division of radiolo- y in the Mayo Clinic, has been appointed x-ray con- ltant in the office of the Surgeon General of the rmy, with the rank of colonel. During World War I, olonel Kirklin served as first lieutenant in the Medi- l Corps and was instructor in the Army School of oentgenology, Fort Riley, Kansas, and chief roent- enologist at the Army General Hospital, Fort Bayard, ew Mexico.

* * *

As the result of a special call for donations of spare r discarded instruments and surplus drugs as contribu- ions to the Medical and Surgical Relief Committee of Amcrica, a most satisfactory contribution to this sal- age material was made at the Committee's exhibit booth t the State meeting held in Minneapolis last month. Dr. Claude C. Kennedy of Minneapolis is chairman of he Minnesota division of the committee, which last ear was responsible for collecting well over 12,000 ounds of salvage material such as examining tables, terilizers and other cquipment including much-needed rugs. Members of the Woman's Auxiliary of the State Association have been active in soliciting con- ributions and assisting the committee in other ways. The present aim of the Committee is to provide Coast Guard patrol boats, Navy subchasers and destroyer escorts with portable emergency medical kits. Filled with essential drugs and instruments, this kit, especially designed for small craft, is prepared to take immediate care of war casualties until the ship arrives at a base hospital. In addition to the medical supplies, the kit carries a simple fishing rig, bait and signaling mirrors— vital tools in the event of shipwreck when a crew may be stranded or must resort to life rafts.

Minnesota doctors who are members of the Medical and Surgical Relief Committee, of which Dr. Kennedy is chairman, are: Dr. Alice H. Fuller, Dr. Gilbert J. Thomas, Dr. Emil C. Robitshek, and Dr. Owen Wangensteen of Minneapolis; Dr. Donald C. Balfour and Dr. Henry W. Meyerding of Rochester; Dr. William R. McCarthy of Saint Paul; Dr. Edward Bratrud of Thief River Falls, and Dr. J. F. Norman of Crookston.



86c out of each $1.00 gross income used for members benefit

PHYSICIANS CASUALTY ASSOCIATION
PHYSICIANS HEALTH ASSOCIATION

Accident, Hospital, Sickness
INSURANCE

For ethical practitioners exclusively
(57,000 Policies in Force)

$5,000.00 ACCIDENTAL DEATH $25.00 weekly indemnity, accident and sickness	For $32.00 per year
$10,000.00 ACCIDENTAL DEATH $50.00 weekly indemnity, accident and sickness	For $64.00 per year
$15,000.00 ACCIDENTAL DEATH $75.00 weekly indemnity, accident and sickness	For $96.00 per year

ALSO HOSPITAL EXPENSE
FOR MEMBERS, WIVES AND CHILDREN

41 years under the same management
$2,418,000.00 INVESTED ASSETS
$11,350,000.00 PAID FOR CLAIMS
$200,000 deposited with State of Nebraska for protection of our members.
Disability need not be incurred in line of duty—benefits from the beginning day of disability.
Send for applications, Doctor, to
400 First National Bank Building Omaha, Nebraska

PROFESSIONAL PROTECTION

SINCE 1899
SPECIALIZED
SERVICE

In addition to our Professional Liability Policy for private practice we issue a special

MILITARY POLICY

to the profession in the Armed Forces at a

REDUCED PREMIUM

THE

MEDICAL PROTECTIVE COMPANY

OF

FORT WAYNE, INDIANA

Cook County Graduate School of Medicine

(In Affiliation with Cook County Hospital)

Incorporated not for profit

ANNOUNCES CONTINUOUS COURSES

SURGERY—Two Weeks' Intensive Course in Surgical Technique starting June 28, July 12, July 26, and every two weeks throughout the year.

MEDICINE—Two Weeks' Intensive Course starting October 4. One-month Course in Electrocardiography and Heart Disease starting the first of every month, except August. Two Weeks' Course in Electrocardiography starting August 2.

FRACTURES & TRAUMATIC SURGERY—Two Weeks' Intensive Course starting October 18.

GYNECOLOGY—Two Weeks' Intensive Course starting October 18. One-month Personal Course starting August 2. Clinical and Diagnostic Courses.

OBSTETRICS—Two Weeks' Intensive Course starting October 4.

OPHTHALMOLOGY—Two Weeks' Intensive Course starting September 27. Course in Refraction Methods October 11.

OTOLARYNGOLOGY—Two Weeks' Intensive Course starting September 13.

ROENTGENOLOGY—Courses in X-ray Interpretation, Fluoroscopy, Deep X-ray Therapy every week.

UROLOGY—Two Weeks' Course and One-month Course available every two weeks.

CYSTOSCOPY—Ten-day Practical Course every two weeks.

General, Intensive and Special Courses in All Branches of Medicine, Surgery and the Specialties.

TEACHING FACULTY — ATTENDING STAFF OF COOK COUNTY HOSPITAL

Address: Registrar, 427 S. Honore St., Chicago, Ill.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

OUTLINE OF ROENTGEN DIAGNOSIS. An Orientation in the Basic Principles of Diagnosis by the Roentgen Method. Second Edition. Leo G. Rigler, B.S., M.S., M.D. Professor of Radiology, University of Minnesota, Minneapolis. 196 pages plus atlas of 254 illustrations. Price, $6.50, cloth. Philadelphia: J. B. Lippincott Co., 1943.

UROLOGY IN GENERAL PRACTICE. Nelse F. Ockerblad, B.S., M.D., F.A.C.S., Professor of Clinical Urology, University of Kansas School of Medicine; Senior Attending Urologist to St. Luke's Hospital; Consulting Urologist to the Children's Mercy Hospital, Kansas City, Mo.; Diplomate of the American Board of Urology, and Hjalmar E. Carlson, B.S., A.M., M.D., F.A.C.S., Instructor in Urology, University of Kansas School of Medicine; Attending Urologist to St. Luke's Hospital and Trinity Hospital, Kansas City; Diplomate of the American Board of Urology. 383 pages. Illus. Price, $4.00, cloth. Chicago: Year Book Publishers, 1943.

ESSENTIALS OF SYPHILOGY. Rudolph H. Kampmeier, A.B., M.D. Associate Professor of Medicine, Vanderbilt University School of Medicine. In charge of the Syphilis Clinic and Visiting Physician to Vanderbilt University Hospital. 518 pages. Illus. Price, $5.00, cloth. Philadelphia: J. B. Lippincott Co., 1943.

CONVULSIVE SEIZURES. How to Deal with Them. A Manual for Patients, Their Families and Friends. Tracy J. Putnam, M.D. Professor of Neurology and Neurosurgery, College of Physicians and Surgeons, Columbia University; Director of Services of Neurology and Neurosurgery, Neurological Institute of New York. 168 pages. Illus. Price, $2.00, cloth. Philadelphia: J. B. Lippincott Co., 1943.

CLASSIFIED ADVERTISING

PRACTICE FOR SALE—Excellent opportunity for good physician and surgeon in town of 2500. Municipal hospital opened a year ago. Present physician retiring because of ill health. Address D-51, care MINNESOTA MEDICINE.

* * *

FOR SALE—Particularly lucrative general and surgical practice, Minnesota county seat city. Completely equipped offices. Would consider associate or partnership. Liberal terms to responsible party. Address D-52, care MINNESOTA MEDICINE.

* * *

DOCTOR WANTED—For locum tenens—no particular time. Address D-53, care MINNESOTA MEDICINE.

BUY WAR BONDS AND STAMPS

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.

414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.

INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS

MAIN 2494

SAVE TIME!

TRY DAHL'S FIRST

Biologicals
Pharmaceuticals
Hypodermic Medications
Dressings
Surgical Instruments
Trusses

7:30 a.m. to 11 p.m.
Holidays, 9 a.m. to 11 p.m.

Joseph E. Dahl Co.

Incorporated

ATlantic 5445 — 82 So. 9th St., Mpls.

Radiological and Clinical

Assistance to Physicians
in this territory

MURPHY LABORATORIES

Minneapolis: 612 Wesley Temple Bldg. - - At. 4786
St. Paul: 348 Hamm Bldg. - - - - - - - Ce. 7125
If no answer, call - - - - - - - - - - Ne. 1291



Orthopedic Braces and Appliances

Physicians' specifications followed precisely. Scientific manufacture and fitting.

AUGUST F. KROLL

Manufacturer

230 WEST KELLOGG BLVD.
St. Paul, Minn. CE. 5330

Hall & Anderson

PRESCRIPTION PHARMACY
BIOLOGICALS
PHYSICIANS' SUPPLIES

SAINT PAUL, MINN.

LOWRY MEDICAL ARTS BUILDING
TELEPHONE: CEDAR 2735

CHECKING SERVICE . . .

The American ECONOMY *Way*

THE AMERICAN NATIONAL BANK offers a NEW PLAN in Personal Checking Accounts.

This service is offered to those who would like to open a checking account but find it inconvenient to maintain the balance required for regular checking accounts. A charge of 7c is made for each check paid, also a nominal charge on deposits.
Open an account for any amount.

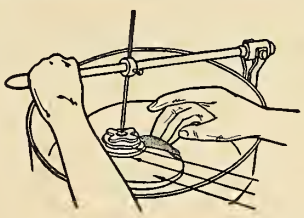
THE AMERICAN NATIONAL BANK

BREMER ARCADE — *Free Parking*
7TH AT ROBERT

Member Federal Deposit Insurance Corporation

Cedar 0573

UNUSUAL LENS GRINDING



CATARACT, MYO-THIN and other difficult and complicated lenses are ground to extreme thinness and accuracy by our expert workmen.

ARTHUR F. WILLIAMS

SAINT PAUL
MINNESOTA

Save 25 to 40 Per Cent

Druggists' Mutual Insurance Company

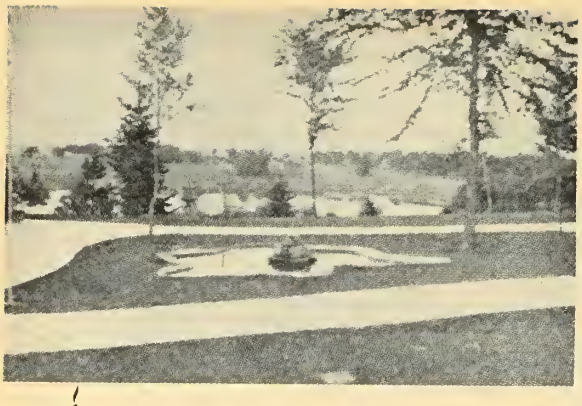
OF IOWA, ALGONA, IOWA

Fire - Tornado - Automobile Insurance

Prompt Loss Service

Minneapolis Branch—S. E. STRUBLE, 835 Palace Bldg.

Home Office—Algona, Iowa



One of the views

Glenwood Hills Hospitals

3501 Golden Valley Road
Hyland Station
Route Seven

Operated In Connection with Homewood Hospital

Plymouth at Penn Avenue, Minneapolis

FOR THE TREATMENT OF NON-SURGICAL AND NON-INFECTIOUS DISEASES

A modern hospital built on the cottage plan. The buildings are located on elevated land, affording beautiful views on all sides. Glenwood Hills Hospitals have all the advantages of rural surroundings, and are still only a few minutes by automobile from the Minneapolis loop.

AN INVITATION

The facilities of these institutions are available for all reputable members of the medical profession.



HOMEWOOD HOSPITAL is one of the Northwest's outstanding hospitals for the treatment of Nervous Disorders—equipped with all the essentials for rendering high grade service to patient and physician.

Operated in Connection with Glenwood Hills Hospitals

HOMEWOOD HOSPITAL, INC.

Corner Penn and Plymouth Avenues North
Minneapolis Minnesota

Social and Educational Adjustment

for exceptional children of all ages. Visit the school noted for its work in educational development and fitting such children for more normal living. Beautiful grounds. Home atmosphere. Separate buildings for boys and girls.

Catalog by request.

The MARY E. POGUE SCHOOL

124 GENEVA ROAD WHEATON, ILL.
(NEAR CHICAGO)

Send us your slow collection items.

All accounts made by personal calls.

We specialize in Medical and Dental Accounts.

Bonded and Licensed Under Minnesota State Laws

Northwestern Adjustment Co.

518 Bremer Arcade Bldg.
St. Paul Minnesota

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 **July, 1943** **No. 7**

Contents

POSTWAR MEDICINE.
Brigadier General Fred W. Rankin, M.C., U.S.A. 601

VIRUS DISEASES OF ANIMALS.
W. L. Boyd, Saint Paul, Minnesota..... 604

FUNDAMENTAL ASPECTS OF VIRUS DISEASES.
Robert G. Green, M.D., Minneapolis, Minnesota.. 606

NUTRITION IN NORMAL ADULTS.
John J. Bochrer, M.D., Minneapolis, Minnesota.. 610

FOOD PREPARATION AND PRESERVATION.
Eva Donelson, Minneapolis, Minnesota..... 616

THE EARLY TREATMENT OF INJURIES TO THE FACE AND NECK.
Gordon B. New, M.D., Rochester, Minnesota.. 619

PAIN AS A SYMPTOM IN APPENDICITIS.
R. A. Glabe, M.D., Plainview, Minnesota..... 622

CLINICAL PATHOLOGICAL CONFERENCE.
Presentation of a Case.
A. J. Hertzog, M.D., and *S. V. Lofsness, M.D.,* Minneapolis, Minnesota 625

CASE REPORT:
Congenital Arteriovenous Aneurysm.
Ramona L. Todd, Ph.D., M.D., Minneapolis, Minnesota 627

HISTORY OF MEDICINE IN MINNESOTA.
History of Medicine in Dodge County. (Continued).
James Eckman, Rochester, and *Charles E. Bigelow, M.D.,* Dodge Center, Minnesota 629

PRESIDENT'S LETTER 635

EDITORIAL:
The New Council on Medical Service and Public Relations 636
Compensation for Occupational Diseases..... 637
Accidental Drownings 638

MEDICAL ECONOMICS:
Railroad Brotherhood Endorses Association Policy 639
How to Secure Payment of Relief Bills..... 640
Health Insurance in Canada..... 641
Minnesota State Board of Medical Examiners.. 641

IN MEMORIAM 642

NEW POLICIES AND PROCEDURES:
New Policies of State Department of Health Regarding Biologics 643
A Guide for Setting up Policies and Physicians' Recommendations for Local Public Health Nursing Services 647
Procedure for Collecting Medical Bills for Services to the Indigent..... 650

MINNEAPOLIS SURGICAL SOCIETY:
Meeting of November 5, 1942..... 651
Nonclosure of Wounds in Acute Appendicitis and the Use of the Gibson-Mickulicz Tampon.
Arthur F. Bratrud, M.D., Minneapolis..... 651
Meckel's Diverticulum.
James A. Johnson, M.D., Minneapolis..... 655

MINNESOTA ACADEMY OF MEDICINE:
Meeting of April 14, 1943..... 656
Changes in the Gastric Mucosa Related to Disease.
James B. Carey, M.D., Minneapolis..... 656

REPORTS AND ANNOUNCEMENTS:
Report of State Delegates to House of Delegates of the American Medical Association, Chicago, June 7, 8, 9, 1943..... 660

WOMAN'S AUXILIARY 663

OF GENERAL INTEREST 664

BOOK REVIEWS 667

Contents of MINNESOTA MEDICINE copyrighted by Minnesota State Medical Association, 1943

Entered at the Post Office in Minneapolis as second class mail matter. Accepted for mailing at the special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 13, 1918.

MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL ASSOCIATION

Published by the Association under the direction of its Editing and Publishing Committee

EDITING AND PUBLISHING COMMITTEE

E. M. HAMMES, Saint Paul
PHILIP F. DONOHUE, Saint Paul
H. W. MEYERDING, Rochester
H. A. ROUST, Montevideo
B. O. MORK, JR., Worthington
A. H. WELLS, Duluth
O. W. ROWE, Duluth
T. A. PEPPARD, Minneapolis
HENRY L. ULRICH, Minneapolis
C. L. OPPEGAARD, Crookston

EDITORIAL STAFF

CARL B. DRAKE, Saint Paul, Editor
GEORGE EARL, Saint Paul, Associate Editor
HENRY L. ULRICH, Minneapolis, Associate Editor

BUSINESS MANAGER

J. R. BRUCE

Annual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian Subscriptions—$3.50.

The right is reserved to reject material submitted for editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

Classified advertising—five cents a word; minimum charge, $1.00. Remittance should accompany order.

Display advertising rates on request.

Address all communications to Minnesota Medicine, 2642 University Avenue, Saint Paul, or National Bldg., Minneapolis. Telephone Nestor 2641.

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN



MAIN BUILDING—ONE OF THE 5 UNITS IN "COTTAGE PLAN"

A Modern Private Sanitarium for the Diagnosis, Care and Treatment of Nervous, Mental and Medical Cases

Located on beautiful Lake St. Croix, eighteen miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Milk, cream and butter from our own herd of Tuberculin-tested Registered Guernsey Cows. Inspection and coöperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

CONSULTING NEURO-PSYCHIATRISTS

Hewitt B. Hannah, M.D.
Joel C. Hultkrans, M.D.
511 Medical Arts Building
Minneapolis, Minnesota
Tel. MAin 4672

RESIDENT PHYSICIAN
Howard J. Laney, M.D.
Prescott, Wisconsin
Tel. 39

SUPERINTENDENT
Ella M. Mackie
Prescott, Wisconsin
Tel. 69



To Sustain Working Efficiency

during hay fever—prompt, prolonged local relief
without appreciable nervous stimulation

Neo-Synephrine
Hydrochloride

(laevo—alpha—hydroxy—beta—methyl—amino—3 hydroxy ethylbenzene hydrochloride)



ACCEPTED
AMERICAN MEDICAL ASSN
Council on Pharmacy and Chemistry

Available in a ¼% or 1% solution in 1-oz. bottles for dropper or spray; and as a ½% jelly in collapsible tube with applicator.

Frederick **Stearns** & Company

Since 1855... ESSENTIALS OF THE PHYSICIAN'S ARMAMENTARIUM

NEW YORK KANSAS CITY **DETROIT, MICHIGAN** SAN FRANCISCO WINDSOR, ONTARIO
SYDNEY, AUSTRALIA AUCKLAND, NEW ZEALAND

ACCEPTED
AMERICAN MEDICAL ASSN
Council on Pharmacy and Chemistry

Zephiran CHLORIDE

Trade Mark Reg. U.S. Pat. Off.

Brand of Benzyl-Trialkonium Chloride

HIGH GERMICIDAL POTENCY

LOW TISSUE TOXICITY

Plus

Properties of

ZEPHIRAN CHLORIDE

Detergent Properties
A Wetting Agent
High Tissue Tolerance
Penetration Ability
Rapid Action
Emollient Effect
Wide Application
Economy

A HIGHLY POTENT GERMICIDE with a low toxicity index is realized in ZEPHIRAN CHLORIDE, cationic detergent and germicide; a mixture of high molecular alkyl-dimethyl-benzyl-ammonium chlorides.

In an evaluation of germicides for clinical use by Hirsch and Novak,* using the phagocytosis inhibiting technic for determining toxicity, Zephiran Chloride was found to be germicidal in a 1:3970 concentration sterilizing infected blood completely, whereas the phagocytosis inhibiting concentration was shown to be 1:3370. The toxicity index of Zephiran Chloride thus is 0.85 as against an average of 5.2 for 70 per cent and 95 per cent alcohol and 900 for tincture of green soap.

*Hirsch, M. M., and Novak, M. V.: Evaluation of Germicides with Relation to Tissue Toxicity. Proc. Soc. Exper. Biol. and Med., June, 1942.

ZEPHIRAN CHLORIDE . . . Germicide for Surgery, Obstetrics and Gynecology, Urology, Dermatology, Eye, Ear, Nose and Throat, Sterile Storage of Instruments.

ALBA PHARMACEUTICAL DIVISION
WINTHROP CHEMICAL COMPANY, INC.
NEW YORK, N. Y. Successor WINDSOR, ONT.



Make the Gift Worth the Giving

Your gift of Camels to a service man has this to commend it:

First, cigarettes are the gift keenly appreciated in the armed forces.

Second, Camel is the brand the men say they prefer above all others.*

So make your gift Camels—the cigarette millions favor among all brands for smooth mildness, mellow, appealing flavor.

Send Camels by the carton—the way they're featured at your dealer. See or telephone him today.

• • •

*With men in the Army, the Navy, the Marine Corps, and the Coast Guard, the favorite cigarette is Camel. (Based on actual sales records in Post Exchanges and Canteens.)

Camel

COSTLIER TOBACCOS

BUY WAR BONDS AND STAMPS



NEW REPRINTS AVAILABLE ON CIGARETTE RESEARCH—ARCHIVES OF OTOLARYNGOLOGY, FEBRUARY, 1943, PP. 169-173—MARCH, 1943, PP. 404-410. COPIES ON REQUEST.

Camel Cigarettes, Medical Relations Division, 1 Pershing Square, New York City



NO ABBREVIATION FOR PITUITRIN!

While abbreviations may save time, physicians who say "an ampoule of Pit" are never sure of getting PITUITRIN*. When PITUITRIN is specified by *its full name* medical men receive the original preparation of its kind, first offered to the profession by Parke, Davis & Company in 1909.

PITUITRIN contains an unusually low percentage of inert or irritating matter and will not deteriorate over long periods of time. Since an excess of acid is not required as a preservative, injection is practically painless.

Clinical results, based on millions of injections, have made PITUITRIN (brand of posterior pituitary injection—U.S.P.) specific for all prepartum and postpartum uses.

*TRADE-MARK REG. U. S. PAT. OFF.

PITUITRIN



PARKE, DAVIS & COMPANY

DETROIT • MICHIGAN

OPTIMUM NUTRITION FOR BABY...

MINIMUM TIME FOR DOCTOR...



with this complete liquid infant formula!

BIOLAC SUPPLIES milk proteins, milk minerals, iron, and vitamins A, B_1, B_2 and D in amounts which equal or exceed recognized requirements for infants. Thus with the sole exception of vitamin C, Biolac provides *complete* nutrition for the bottle-fed baby.

Biolac is a real timesaver for overworked doctors, too! *No carbohydrate or other extra formula ingredients to calculate!*

Also, with Biolac there is less chance of upsets due to errors in preparing formulas. Less chance of formula contamination, too, because Biolac requires only simple dilution with boiled water, as you prescribe.

NO LACK IN BIOLAC

Borden's complete infant formula

● *Biolac is prepared from whole milk, skim milk, carbohydrates—Vitamin B_1, concentrate of Vitamins A and D from cod liver oil, and ferric citrate. It is evaporated, homogenized, and sterilized. For professional information, write Borden's Prescription Products Division, 350 Madison Avenue, New York, New York.*

A COMPLETE TRUSS AND APPLIANCE DEPARTMENT AT YOUR SERVICE

Obviously, no doctor can keep on hand all of the sizes and the variety of styles of trusses, supports, and hosiery his patients are likely to need. The investment and space required would be all out of proportion to the demand.

To provide you with a practical solution to this problem, we maintain the largest and most complete truss and supporter department in the Northwest. We carry in stock thousands of trusses and supports. We also maintain a complete fitting department under the direction of experienced men who are competent to handle the most difficult cases. In other words, we carry the stock and provide the facilities that enable you to give your patients the finest truss service available.

All of the facilities of this department and every other department in our organization are yours to use any time you wish. Innumerable physicians realize the advantages of sending their orders to us for such appliances. They know they can obtain any type of truss, physiological support or elastic stocking from us and that they will always receive the very best in quality. Our vast stocks insure prompt service. You can send your patients to us with the assurance that they will be given every consideration. If you wish to fit your patients in your own office, the trusses and supports required may be ordered by mail with perfect confidence. Orders are shipped the same day they are received.

If you are not already making use of our truss services, we urge you to do so and see for yourself, as thousands of others are doing, that here is the place to get quality merchandise and prompt, efficient service at economical prices.



The picture above shows two of our truss cabinets loaded with a few of the many different styles of trusses which we carry in stock so that we can fit any case, no matter how difficult it may be. Below is a picture of one of our fitting rooms.



With increased smoking

YOUR ADVICE TO SMOKERS

is increasingly important

In judging the irritant properties of cigarette smoke, it is good practice to consider the research conducted. In judging *research,* you no doubt consider its *source**.

PHILIP MORRIS claims of superiority are based *not* on anonymous studies, but on research conducted only by competent and reliable authorities, research reported by leading journals in the medical field.

Clinical as well as laboratory tests have shown PHILIP MORRIS to be definitely and measurably less irritating to the sensitive tissues of the nose and throat. May we send you reprints of the studies?

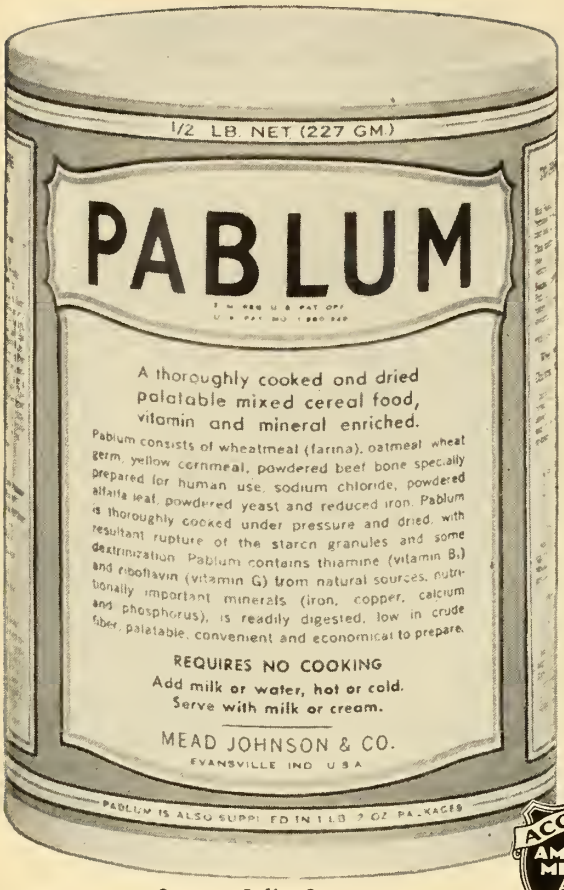


PHILIP MORRIS

PHILIP MORRIS & CO., LTD., INC.
119 FIFTH AVENUE, N. Y.

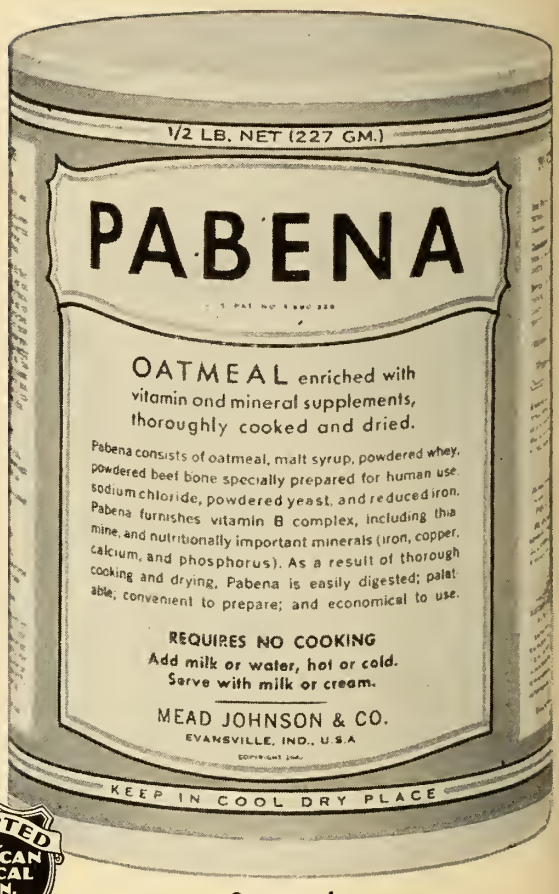
**Laryngoscope, Feb. 1935, Vol. XLV, No. 2, 149-154. Laryngoscope, Jan. 1937, Vol. XLVII, No. 1, 58-60. Proc. Soc. Exp. Biol. and Med., 1934, 32, 241. N. Y. State Journ. Med., Vol. 35, 6-1-35, No. 11, 590-592*

1932 **1942**



8 oz.—1 lb. 2 oz.

ACCEPTED AMERICAN MEDICAL ASSN. Council on Foods



8 oz. only

PABLUM, the pioneer precooked fortified infant cereal, now has a companion-product: Pabena is a precooked oatmeal cereal, lending variety to the infant's diet and offering the nutritional and convenient features of Pablum.

BOTH continue to be marketed and advertised only to the medical profession. Samples available on physicians' requests.

MEAD JOHNSON & CO., EVANSVILLE, IND., U.S.A.



2153 Lederle employees and more than 500 former employees now in the armed forces, share the honor symbolized by the Army-Navy "E".

From research laboratory and production line more than fifty different therapeutic and prophylactic products are included in Lederle's steadily growing contribution to the war effort.



Sulfonamide Tablets in soldiers' kits.



Tetanus Toxoid for the production of active immunity to tetanus.



Life-saving blood plasma.



Blood typing for every soldier's identification tag.

LEDERLE LABORATORIES, Inc., NEW YORK, N.Y. — A UNIT OF AMERICAN CYANAMID COMPANY

PYOKTANIN SURGICAL GUT

Plain and Formalized

Manufactured Since 1899 by

The Laboratory of the Ramsey County Medical Society

Packaged dry in hermetically sealed glass tubes in accordance with the new requirements of the U. S. Pharmacopœia.

• • •

Price List

PLAIN TYPE A NONBOILABLE
AND
FORMALIZED TYPE C NONBOILABLE

Sizes.....000 — 00 — 0 — 1 — 2 — 3
28 inches.....per dozen strands $2.00
60 inches.....per dozen strands $3.00

Special discount to hospitals and to the trade. Cash must accompany the order.

• • •

Address

LABORATORY RAMSEY COUNTY MEDICAL SOCIETY

Lowry Medical Arts Building, St. Paul, Minnesota

FOR SALE BY SURGICAL DEALERS AND DRUGGISTS



That's how hundreds of x-ray laboratories feel about G-E's *Periodical Inspection and Adjustment Service,* which keeps their equipment in A-1 operating condition the year round.

Just as your automobile continues to give the most satisfactory and most economical performance, year after year, when competently serviced at regular intervals, so it is with fine x-ray equipment. To this end *P. I. and A. Service* has for thirteen years been extended to x-ray users everywhere through G-E's nationwide field organization. And continues despite difficulties imposed by today's wartime restrictions.

P. I. and A. is a tangible service. The owner of x-ray equipment actually contracts for it, stipulating the number of periodical equipment check-ups he desires the G-E Service Engineer to make during the year. And you'll find upon inquiring among those who have long used this service, that they consider it a negligibly low-cost insurance on their original investment. Yes, needed minor adjustments, when immediately attended to, help to prevent serious trouble and costly repairs.

In your vicinity, this service is extended through the G-E offices and regional service depots listed herewith. You can rely on our factory-trained men in these offices to give you helpful technical information at all times.

MINNEAPOLIS
321 Medical Arts Bldg.
Nicollet Ave. & Ninth St.

DULUTH
526½ East First Street

GREEN ISLE
Mr. N. E. McMahon

ST. PAUL
174 E. Sixth Street

SIOUX FALLS, S. DAK.
2028 S. Covel Avenue

FARGO, N. DAK.
712 Fourth St. S.

ARMY E NAVY

Today's Best Buy
U. S. War Bonds

GENERAL ELECTRIC
X-RAY CORPORATION
2012 JACKSON BLVD. CHICAGO, ILL., U. S. A.



REST HOSPITAL

A quiet, ethical hospital with therapeutic facilities for the diagnosis, care and treatment of Nervous and Medical cases. Invites coöperation of all reputable physicians who may supervise the treatment of their patients.

PSYCHIATRISTS IN CHARGE
Dr. Hewitt B. Hannah
Dr. Joel C. Hultkrans

2527 2nd Ave. S., Minneapolis, Phone At. 7369

POKEGAMA SANATORIUM

operated by

H. LONGSTREET TAYLOR FOUNDATION



Reception Hospital

Thoroughly Equipped for the
Medical and Surgical Treatment of

TUBERCULOSIS

Artificial pneumothorax, oleothorax, phrenicectomy, thoracoplasty, pneumolysis, bronchoscopy, alpine lamp and heliotherapy. Operating, throat, dental and lamp rooms. Complete clinical and X-ray Laboratories.

Electric Blankets in All Beds

A reduction has been made in rates.

Railroad, Bus, Telegraph and Telephone Stations: Pine City, Minn. Descriptive circular sent on request.

F. F. CALLAHAN, M.D., Medical Director
POKEGAMA, PINE COUNTY, MINN.

CHILDREN ADMITTED



Let's Not Ration Loveliness

Let's not ration loveliness; it is essential to our way of life; it helps to offset the ugliness of war. We may have to conserve the means by which we achieve and maintain loveliness (nowadays we should buy everything *conservatively*, except War Bonds), but even so we shall contrive to look lovelier and fresher than we used to in the days when beauty aids were as abundant as blossoms in May. . . . If we use our beauty aids with more intelligence and less waste, with greater artistry and restraint, they will go further and achieve for us a lovelier cosmetic effect. . . . With more and more women doing the work of men in defense jobs and in the armed forces, not to mention the thousands of women in various branches of OCD, it is desirable that we cling to those nice habits of personal care, to those charming little vanities, if you like to call them that, which are such an integral part of the loveliness of American womanhood. . . . But let's not be extravagant with our beauty aids; let's select them wisely to suit our requirements, and use them effectively and *conservatively*.

Luzier's Fine Cosmetics and Perfumes Are Distributed In Minnesota By:

District Distributors

Louise Roberts
304 Medical Arts Bldg.
Minneapolis, Minn.

Mae Nagle
Ormonde Hotel
Virginia, Minn.

Kay McCarthy
Fairmont, Minn.

Assistant District Distributor

Eva Byrne
610 3rd St. S.E.
Little Falls, Minn.



CONFIDENCE

. . . BELIEF IN
TRUSTWORTHINESS

Confidence in Lilly products has grown out of an unbroken record of ethical dealing with the medical profession and an understanding of the Lilly policy of supplying only pharmaceutical preparations of highest quality and of unvarying potency.

Lilly

ELI LILLY AND COMPANY

INDIANAPOLIS, INDIANA, U.S.A.



Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 July, 1943 No. 7

POSTWAR MEDICINE

BRIGADIER GENERAL FRED W. RANKIN, M.C., U.S.A.

THE realization that I am about to relinquish the office of President of this Association prompts me to pass in review our record, crammed with exciting events, and to scan the horizon anxiously for gathering storms which may imperil our course and test further our courage and endurance. That we have kept a steady course set toward the maintenance of the health of the nation and its armed forces during these turbulent times of world-wide hostilities, despite hurried preparation, bespeaks our Association's self-sacrificing devotion to duty and emphasizes its indomitable spirit and resolute determination—characteristics distinctly American. Never during its history or, for that matter, during the history of our country, has there been the urgent demand which current exigencies have imposed on our special talents and skills. The rapid, thorough and efficient manner in which these demands were met has been due in great measure to the astute foresight of our leaders, who, long before that fateful day, when our enemies treacherously launched us into this holocaust, began careful preparations for the inevitable requirements which develop, as a consequence of the military, industrial and continuing civilian needs for adequate medical care. That these plans were well contrived and intelligently executed is forcefully demonstrated by the continued improvement in the health of our nation and our armed forces, despite the fact that about 40 per cent of the usable medical personnel of the country has entered the services, and the added burden of a parallel gigantic industrial expansion that has been placed on the thinned ranks of the remaining civilian physicians. My deep gratification in reporting this thrilling and inspiring performance is heightened only by my humble respect and intense appreciation for the high honor you so generously bestowed on me as your president in this trying period, and for the distinct privilege in participating in these activities and in associating with the scrupulously sincere, assiduously attentive and particularly competent members of the Board of Trustees and the Executive Staff of this Association.

During the past year our country has been feverishly engaged in mobilizing and preparing its industries and manpower for war on a scale unprecedented in its history. All efforts have been directed toward a single fundamental purpose—the creation and preparation, as rapidly as possible, of a formidable military machine with irresistible striking power. This has required a national metamorphosis in which the medical profession has participated eagerly and wholeheartedly. Indeed, no other group has shouldered its responsibilities in this emergency with greater self-abnegation, more cheerful enthusiasm and more efficient adaptability. On us devolved the obligation of establishing a bulwark against epidemic disease and military casualties, both on the home front and on the far-flung battlefields of this globe-encompassing war. Essentially our function is concerned with the conservation and maintenance of health. That we have performed this function successfully is demonstrated by the fact that we have given our civilian workers production superiority in the rapidly expanding war-geared industries, and our armed forces combatant superiority in the jungles of Guadalcanal, on the gale-swept North Atlantic and on the blistering deserts of North Africa.

President's address delivered before the House of Delegates of the American Medical Association, Chicago, Illinois, June 7, 1943.

The most difficult and exigent phase of the war, i.e., rapid mobilization, has been expeditiously concluded. Now our paramount problems are concerned with logistics; production has been achieved. Consideration is already being given to postwar planning even though it may seem little warranted at this time. It should be realized, however, that only by such long range charting can the confusion and disorder which characterize immediate postwar reconstruction periods be averted. The manifold problems arising from these future developments will deeply concern and intimately affect us all. A rational solution of these problems depends on their thorough comprehension; but first they must be sighted as distantly and as clearly as possible. Accordingly we set a watchful gaze on the horizon.

It must now be apparent, even to those who have been most purblindly recalcitrant, that mighty influences are at work to effect epochal changes in the complexion of medical practice. While it would appear that these influences have suddenly loomed on the medical scene, it should be realized that they have long been forming and that the present military conflict has merely hurried their development and magnified their significance. That they can no longer be ignored seems difficult to controvert. We must face realistically these tremendously forceful socio-economic trends which are intimately involved and deeply concerned with the nation's medical problems. The directional sign posts of postwar planning may now be clearly read by proposals already made for broadening the social security program and extending the nation's economic resources to assure "adequate medical and health care for all, regardless of place of residence or income status." The complex connotations and inevitable implications of these plans and proposals make it quite apparent that the old system of medical practice will be considerably modified. If the limitless and baneful potentialities that can be projected into the science and art of the future of medicine are to be averted, it becomes imperative in this transition period that the wise and tempered counsel of the medical profession exert its proper influence. That our medical descendants should look back and point a culpable finger to our page of history which would read that our actions were "too little and too late" is a plaguing thought. Our responsibility in approaching and participating in these evolutionary processes is greater than many of us have been willing to admit; indeed, it is intimately involved with the medical security of our country as well as of our profession. Have we so long basked in the luxuriating rays of medicine as the apotheosis of professions that we have become languid and inelastic in our attitude and hesitant and fearful in our response to existing socio-economic developments? I sincerely hope not.

Our motives are inherently sincere. They are based on desiderata to which we have held tenaciously and which we must guard assiduously lest future progress toward higher standards in medicine and professional tenets be jeopardized. Our ultimate objectives consist essentially in the provision of the best possible preventive measures against disease, the institution of the best possible forms of therapy and the ceaseless pursuit of advances and improvements in technical procedures and other prophylactic and therapeutic measures for clinical application. It requires no percipient degree of rationalization to realize that the complete fulfillment of these objectives for the entire nation would necessitate the development of a comprehensive medical service.

It is becoming increasingly apparent that the trends now gathering momentum are directed toward some form of national health service as an integral function of the state. Proposals of this nature by governmental postwar planning agencies, both here and abroad, have been the subject of deep consideration, wide editorial comment and cognent discussion. This mood has been further reflected in recent comments by various medical and nonmedical writers who have penetrated with incisive clarity to the very heart of this controversial subject. It has been stated by some that the financing of this type of medical service is a socio-economic consideration and not a medical problem. While it may be argued that financial provision for the institution of such a service is a function of the commonwealth, I am impelled to emphasize the fact that the structural character of the organization of any such type of health service is tremendously important to doctors and is vitally concerned with the execution of their professional function. This entire subject must be brought into sharp focus by the light of trenchant and dispassionate thought in order to observe both the desirable as well as the possible apprehensive aspects of the contemplated proposals.

In the national fulfillment of our altruistic objectives it must be recognized that two essential provisions are required, namely, professional and financial facilities. It must also be recognized that the successful attainment of these objectives cannot be accomplished if in the implementation of any plan or proposal the professional facilities are subjugated to the authoritative management, traditionally dictated by political whims, of some legislative council controlling the financial provisions. These two provisions are interdependent and cannot be distinctly separated in approaching our objectives. The successful application of the former requires certain facilities supplied by the latter, which in turn can be guided intelligently only by professional knowledge. These vastly significant facts must be sincerely appreciated by all parties, both medical and nonmedical, concerned with this problem in their approach to its solution.

It is necessary to realize that the establishment of one of these contemplated medical services does not sound the death knell of private practice of medicine. These two forms of medical service are not incompatible, and their consideration must not be regarded in the light of apostasy but rather in the light of realism. They become incompatible only if in attempting their admixture certain undesirable ingredients are added. The problem is too difficult, the time is too short and the stakes are too thigh for all concerned to allow these factors to influence our actions. All efforts must be harmoniously combined and closely coordinated toward the elaboration of an intelligent program which will permit a democratic as well as a comprehensive medical service with equally high professional and ethical standards.

It should be clearly understood that this embraces the concept of existing freedom of thought and action in the exercise of our profession and our scientific pursuits. No one is more keenly aware, no one more fully cognizant than I, of the resultant stultification of the science and art of medicine which would be occasioned by any loss or curtailment of this freedom. Here is a principle which is more than a heritage; indeed, it forms the supporting foundation of the art of medicine and the guiding light of the science of medicine. It was freedom to think and freedom to express thought in speech and in writing unhampered by the fearful consequences of traditional or legislative authority that permitted medicine to progress to its present exalted position in the field of science, and it is absolutely essential in its continued advancement. It is a principle therefore, which we can never relinquish.

Since the challenges now confronting medicine will undoubtedly be multiplied as we approach the termination of this conflict and the commencement of the difficult reconstruction period, it becomes our responsibility and duty, with ever mounting importance and increasing urgency, to prepare to meet them now. In addition to the problems concerned with medical practice, we must be ready to meet the related problems of postwar rehabilitation of physicians—physicians whose entry into service involved personal sacrifices and the revamping of plans and ambitions, and whose return to civilian pursuits will necessitate numerous and variable readjustments and even resumption of specialized training.

These are prodigious tasks with manifold ramifications and far-reaching significance, but tasks which we must face with unflinching resolve. Their achievement will demand not only sincerity of interest, integration of effort and clarity of thought but also active and close collaboration with appropriate governmental agencies. We cannot disregard the growing interest of the public, the government and various lay groups in the administration of medical care; nor can we afford to engage in a struggle for domination. The solution to these problems and the attainment of our objectives do not lie in that direction. They can be approached more expeditiously by a willingness to share their responsibilities and a readiness to coöperate in their consideration. The importance and urgency of these various problems commend the immediate establishment by this Association of suitable agencies for their investigation. In the institution of these agencies the purpose and vast significance of their function, the sharp delineation of their problems and the need for their collaboration with others should be emphasized. They must also be impressed with the importance of these studies and their resultant proposals on which so much depends. Indeed, the plan of action which we institute, the attitude which we manifest and the intelligence, zeal and judgment which we employ now in our efforts to solve these problems will greatly influence and actually determine the future standards of the medical service of our country and the cultural standards of our profession.

VIRUS DISEASES OF ANIMALS

W. L. BOYD

Division of Veterinary Medicine, University Farm

Saint Paul, Minnesota

LOEFFLER and Frosch, in 1897, demonstrated that the etiologic factor of foot-and-mouth disease was a filtrable virus. Since that time much active research has been done in the field of viruses in relation to animal disease. It is known that there are at least thirty-eight different diseases of animals caused by viruses. While many of these diseases do not exist within the borders of the United States, the number occurring here is important; and in some species of domesticated animals diseases caused by viruses are among the most serious with which we have to contend.

Virus infections ocurring in both animals and man include rabies, equine encephalomyelitis, vaccinia, psittacosis, foot-and-mouth disease, louping-ill of sheep and equine pernicious anemia. With the exception of foot-and-mouth disease and louping-ill, all the above mentioned diseases occur in the United States.

With regard to the economic importance of virus diseases in farm animals, we have no hesitancy in placing hog cholera in the very front rank. This disease is responsible for the greatest economic losses in swine. Introduced into the United States in 1883, it spread rapidly throughout the Corn Belt section of the country. It was first believed that hog cholera was caused by a microscopic organism, *Salmonella choleræ-suis*, which was discovered by Salmon and Smith in 1885. In 1903, de Schweinitz and Dorset discovered that the blood of cholera-infected swine did not lose its infectious nature after having been passed through bacteria-retaining filters. Continued research by Dorset, Bolton and McBryde, which revealed that hog cholera was caused by a filtrable virus, led to the development of an antiserum in 1908. The virus of hog cholera is found in practically all body tissues, as well as in the excretions and secretions of the hog. The discovery of the virus and the development of anti-hog cholera serum proved to be one of the most notable achievements of the Bureau of Animal Industry.

Notwithstanding the fact that the simultaneous method of immunization is highly satisfactory if properly performed, hog cholera continues to take a heavy toll each year. Recent developments in the field of hog cholera research have brought forth new preventive agents in the form of vaccines. These vaccines, although still in the experimental stage, give promise of becoming highly efficient agents for the control of this important infectious disease. These vaccines are chemically prepared, one from tissue extracts and the other from the blood of the cholera-infected pig.

Equine encephalomyelitis, when viewed from an economic standpoint, is second to hog cholera in importance. The virus of this disease, however, unlike that of hog cholera, is capable of infecting a wide variety of hosts, and for this reason it seems apparent that the term equine encephalomyelitis is a misnomer.

Within the past ten years, encephalomyelitis has become the most important of all diseases of the equine, and now that it is known to occur in man constitutes also a definite problem in public health. The virus of this disease was discovered by Meyer, Haring and Howitt, in 1931. Within a comparatively short time it spread to almost every state in the Union. The most extensive outbreak occurred in 1938, when approximately 185,000 cases were reported. There are two strains of the virus, one known as the Western strain and the other as the Eastern strain. The Eastern strain has shown little inclination to spread, being confined, with one exception, to the eastern seaboard states. Eklund and Blumstein, in November, 1938, reported that six cases of encephalitis had appeared among people in rural districts who had been in contact with horses known to have been affected with encephalomyelitis. During the same period, Fothergill and his colleagues reported finding Eastern strain of equine virus from human cases in Massachusetts. Also in 1938, Howitt succeeded in isolating the Western strain of virus from the brain of a child.

"Paper No. 2018, Scientific Journal Series, Minnesota Agricultural Experiment Station."

Read in Symposium on Virus Diseases at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 29, 1942.

It has repeatedly been shown that susceptibility to this disease is greatest in young horses and that it reaches the height of its frequency during the summer and early fall. The cessation of the disease is abrupt with the occurrence of killing frosts.

As shown by Kelser, biting insects, particularly mosquitoes, constitute the chief vectors of the virus. A wide variety of avian and animal species can be infected with the virus of encephalomyelitis. Among these are the chicken, dog, goose, owl, pigeon, turkey, flicker, killdeer, pheasant and quail. Some of the above fowls have been found to be natural reservoirs of the virus.

Horses can be given a high measure of protection against encephalomyelitis through vaccination. The present-day vaccine is prepared from the chick embryo and is administered intradermally in two doses of 1 c.c. each, one week to ten days apart. We are of the opinion that through widespread vaccination of horses and mules, we can greatly assist in preventing the infection in man.

Rabies is one of the oldest of the known infectious diseases, and like hog cholera, is a perennial problem. With regard to host selection, however, it differs widely from the virus of cholera in that it possesses a very wide range of pathogenicity. The dog is the animal most commonly affected, although other carnivorous animals are often involved. The disease is transmitted from animal to animal and from animal to man by the bite of an infected individual. With the exception of Australia, this disease is world wide in distribution. In Minnesota, rabies is confined largely to the urban areas. Only rarely do we encounter the disease in our farm animals.

From the standpoint of diagnosis and control, rabies presents a most difficult problem. The control should be easy, but due to public clamor against restrictions upon the activities of the dog as related to quarantine and muzzling restrictions, the institution and enforcement of effective control measures are most difficult. The successful control of vicious and nondescript dogs would, in our opinion, be very effective in lessening the incidence of the infection.

Interest in vaccination as a control measure in dogs is growing. At present, however, results have not been sufficiently encouraging to rely upon vaccination as a measure to protection, unless in conjunction with rigid quarantine measures. We predict that rabies will not be satisfactorily controlled in this country until dogs are kept under better control and until the general public will acquiesce to proper disposal of stray and ownerless dogs. Any dog which has bitten a human being should be considered as a rabid animal until proved otherwise. This we feel should be the advice of every physician, regardless of the history of the case.

Foot-and-mouth disease, also known as aphthous fever and vesicular fever, is a highly infectious disease attacking chiefly ruminants and swine. Man also is susceptible. The disease at present is prevalent in central Europe and is also present in Asia, Africa and in certain portions of the British Isles and our South American countries. At the present time, Canada and the United States are free from this disease.

The United States has been invaded by the virus of this disease on nine different occasions. In each instance, the disease has been stamped out by the vigorous activity of the state and federal governments. The first outbreak occurred in 1870. It recurred in 1880, 1884, 1902, 1908 and in 1914, when it became quite widespread. After that it did not recur until 1924, when the outbreak was confined mainly to California, where the disease not only occurred in domestic cattle but also involved a large number of wild deer.

As in many other virus diseases, diagnosis is difficult. Differentiation of this disease from other similar ailments is dependent upon animal inoculation. Calves and horses are usually employed for inoculation purposes. If the virus of the foot-and-mouth disease is present, the calves will show the characteristic vesicles, while the horse will remain unaffected. Vesicular stomatitis, a highly acute virus disease of horses and cattle, is fairly common in Minnesota during the summer season. Because of its close resemblance to foot-and-mouth disease, its presence at first is quite alarming. Its occurrence in the horse, however, serves as a ready and reliable means of differentiation.

Vaccination for the control of foot-and-mouth disease has been tried in several of the European countries, but while it gives a certain amount of protection, it is very far from being satisfactory as a control measure. In general, the various methods of diagnosis as applied to virus diseases are far from being satisfactory. This

is especially true of hog cholera, rabies, equine encephalomyelitis, and pernicious anemia.

The pox diseases of animals include cowpox, sheep pox, fowl pox and swine pox. These infections are closely related, the clinical picture in all animals being quite similar. With the exception of cowpox, which may be transmitted to man, all are apparently adapted to a single host.

In connection with fowl pox, it may be said that this disease is spread largely through mosquitoes. From the standpoint of immunization it may be stated that vaccination, though crude, is a fairly satisfactory means of control if performed at a favorable time in the life of the bird to avoid the production period. The age of the bird is important, the ideal period being from eight to ten weeks of age. Immunization of fowls by vaccination is equivalent to giving a mild attack of the disease. As yet no form of vaccination has been developed for the control of swine pox, sheep pox, or cowpox.

Infectious equine anemia, or what is more commonly known as swamp fever, has quite a geographical distribution within the United States, but it is decreasing in frequency each year. This disease usually runs a chronic course. Experimentally it has been transmitted by the common stable fly, *Stomoxys calcitrans,* and certain of the more common species of mosquitoes. The losses resulting from this disease are principally from the standpoint of inability to work. In one or two cases this disease has been reported to occur in man.

References

Dorset, M., Bolton, B. M., and McBryde, C. N.: The etiology of hog cholera. U. S. Bur. Anim. Ind., Bul. 72, 1905.

Eklund, C. M., and Blumstein, A.: Relation of human encephalitis to encephalomyelitis in horses. Jour. A.M.A., 3:1734-35, (Nov. 5) 1938.

Fothergill, L. D., Dingle, J. H., Farber, S., and Connerley, M. L.: Human encephalitis caused by the virus of the eastern varieties of equine encephalomyelitis. New Eng. Jour. Med., 219:411, 1938.

Howitt, B. F.: Recovery of the virus of equine encephalomyelitis from the brain of a child. Sci., 88:455-56, (Nov. 11), 1938.

Kelser, R. A.: Mosquitoes as vectors of the virus of equine encephalomyelitis. Jour. Am. Vet. Assn., 82 (N. S. 35): 767-71, (May) 1933.

Loeffler and Frosch: Cited in Vetherinary Bacteriology, Merchant I. A.: Chap. 38, p. 539, General characteristics of filtrable viruses. Iowa State College Press, Ames, Iowa, 1940.

Meyer, K. F., Haring, C. M., and Howitt, B.: Etiology of epizootic encephalomyelitis of horses in the San Joaquin valley, 1930. Sci., 74:227-28, (Aug. 28) 1931.

Salmon, D. E., and Smith, T. E.: Op. cit. (Merchant, I. A.) Chap. 20, The Genus Salmonella, *Salmonella choleraesuis,* p. 311.

de Schweinitz, E. A., and Dorset, M.: A form of hog cholera not caused by the hog cholera bacillus. U. S. Bur. Anim. Ind. Bul., 41:581, 1903.

FUNDAMENTAL ASPECTS OF VIRUS DISEASES

ROBERT G. GREEN, M.D.

Minneapolis, Minnesota

VIRUSES represent a group of microscopic and submicroscopic disease-producing agents which are variable in size and grow only as intracellular parasites in living protoplasm. An erroneous idea that viruses are simple chemical agents has arisen from some of the studies conducted on the smaller viruses, which have been described as virus molecules or even as living molecules. Such descriptions are not applicable to viruses in general, as the largest of the viruses seem to differ very little from ordinary visible bacteria. Viruses range in size from the magnitude of the smallest visible bacteria such as *Pasteurella tularensis,* down to about 1/25 the size of *Pasteurella tularensis,* so that the smaller forms are well beyond the limit of microscopic visibility. The range of magnitudes of viruses extends from the range of wave lengths of ultraviolet light down to the magnitudes of the longest x-rays. Any concept of viruses must include this variability of their dimensions. While the nature of viruses is not fully established, viruses are best explained as incomplete, or partial, microbic forms—microbes that have become more or less simplified and correspondingly smaller as a result of their parasitic existence.

Growth of a virus within a cell produces several effects, the end result of which seems always to be dissolution of the cell, which allows the virus to escape and attack other cells. One effect produced by many viruses before necrosis becomes evident is the stimulation of inclusion-body formation. The inclusion bodies may be intranuclear or they may be cytoplasmic. In some cases the inclusion bodies are finely granular, and the granules represent particles of virus. In

Read in Symposium on Virus Disease at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 29, 1942.

other cases the inclusions appear to be derived largely from the cell constituents. As the inclusion bodies produced by any virus are of a single type and are generally uniform, they are helpful in identifying a particular virus. Another effect produced by some viruses is stimulation of the host cell to grow and thereby produce tumorous lesions. Rabbit horns, which are infectious papillomas occurring in wild cottontail rabbits, are an example of lesions resulting from such virus activity. The oral papilloma of dogs is another tumor produced by an easily-demonstrated virus.

In their stimulation of the growth of tumors and in the production of generalized disease, viruses are specialized as to the kind of cell which they invade. The rabies virus, for example, seems to grow only in nerve cells; and the papilloma virus of dogs is not only restricted to growth in epithelial cells, but is even restricted to growth in that type of epithelial cell found in the oral cavity. The yellow fever virus is capable of growing in several types of cell, such as hepatic cells and nerve cells. The smallpox virus grows in cells of the skin epithelium, in nerve cells, and in various types of less differentiated cells. In general, a virus seems especially adapted to grow in some type of differentiated cells, but it also has the ability to grow in such undifferentiated cells as make up the reticulum of organs. The kind of cells that a virus invades determines the nature of the disease produced and, to some extent, determines the severity of the infections in cases in which cells invaded are highly essential to life. If a virus has the ability to invade more than one kind of cell, natural variations in its tendency to invade one type of cell more than another result in a variable picture of the clinical disease it produces. I shall discuss later how advantage may be taken of these variations of cell specialization in the artificial modification of viruses.

It has already been pointed out that viruses are disease-producing agents specialized to grow within cells, and further specialized to invade certain kinds of cells. Another important specialization of viruses has to do with the kind of animal in which it produces disease. The range of animal hosts that a virus may invade is also a character of the virus. For some viruses the host-range is very great, as it is in the case of rabies, which has the ability to invade any kind of bird or mammal. The virus of equine encephalitis appears similar in this respect, as it has now been isolated from such diverse species as horses, ground squirrels, and pheasants. The canine distemper virus is much more restricted in its invasive properties, as this virus seems capable of producing distemper in the members of only three, comparatively related, families: the weasel family, the raccoon family and the dog family. The viruses that produce tumors seem to be most highly restricted as to the species of animals that they can invade. The virus of the rabbit papilloma will grow only in certain members of the rabbit family. The virus producing oral papillomatosis of dogs will infect only dogs, and is not infective for the closely related red fox.

The specific characters of any virus include the range of cell types in which the virus will grow and the range of animals in which virus invasion can occur. For some viruses, such as the rabies virus, which seems to grow only in nerve cells, there is a characteristic high restriction in invasive properties for cell types. At the same time this virus is capable of producing rabies in an extremely broad range of animal hosts—in fact, in any mammal or bird. On the other hand, some viruses may be restricted as to the kind of animal in which they produce disease but have the ability to invade a variety of cells.

The most highly specific of all viruses appear to be those that have taken on the special character of stimulating growth of the host cell. Their invasive power seems to be limited to a single type of cell in a single species of animal. This has been demonstrated experimentally in the case of a great many animal tumors that are now known to be caused by viruses, by the accomplishment of transmission through the inoculation of the same type of cell and the same kind of animal in which the original tumor occurred. Because of this high specialization of tumor-producing viruses to the kind of host cell that they invade, the direct demonstration of a virus etiology of a human tumor would seem to depend upon a similar procedure.

A significant advance in the techniques of handling viruses was made in the introduction of chick embryo as a culture medium. The essential character of chick embryo with regard to virus cultivation is that the embryonated egg rep-

resents a mass of cells that are embryonic in type, or in which cellular specialization is not greatly advanced. Likewise, in the embryonated eggs there is considerable lack of species differentiation. Many viruses can be grown in the undifferentiated tissue of embryonated eggs that cannot be grown in fully formed animals, which possess specific cell-types and species identity, unless the animals happen to meet the rigid requirements of the viruses as to cell-types and species.

In their general aspects, virus diseases are not markedly different from diseases caused by bacteria and protozoa. Like other infectious diseases, they are transmitted from one host to another by such simple means as direct contact, as in the case of influenza, and such complex means as transmission by a biting insect, as in the case of yellow fever. Virus diseases differ from at least many microbic diseases principally in that the apparent damage is somewhat more systematic as a result of the fact that viruses grow only in certain kinds of cells, to which the damage is confined.

A blood-borne immunity is produced by virus diseases that is not significantly different from that produced by microbic diseases. Antibodies appear in the blood which may agglutinate or precipitate virus particles, or produce complement fixation. Further, antibodies can be demonstrated which will inactivate the virus, either temporarily or permanently. Evidence is developing that in virus diseases there is also a special kind of immunity, which may be described as *cellular immunity*, in which the cells themselves become refractory to virus invasion or growth, quite independent of blood antibodies. This is an aspect of virus immunity which will take on added importance as virus studies are pursued further. Most virus infections result in a permanent immunity; but in certain virus diseases, as in the case of some of the microbic infections, the immunity existing after recovery may gradually decrease to a point at which the individual is again susceptible.

Artificial active immunization against virus diseases may be accomplished by the injection of large concentrations of inactivated virus, or by the use of attenuated or modified strains of a virus, which are inoculated while still alive. Killed-virus vaccines, ordinarily prepared by treating with formalin tissues that contain the virus, are not practicable for immunization against most diseases because such infected tissues as can be obtained for their preparation usually contain a very low concentration of virus, and many injections of the vaccine must therefore be given to produce an appreciable immunity. Moreover, the immunity from this type of vaccine is relatively short-lived. In the case of equine encephalitis a rather successful killed-virus vaccine has been developed because a high concentration of virus can be obtained by cultivation in chick embryo. It has been stated that within one embryonated egg an amount of virus can be produced that would correspond to the amount of virus found in the brains of 40,000 horses dead of this disease.

The most successful type of vaccine yet developed for any disease is the modified live-virus type, of which the classical example is the vaccinia virus. The process of experimentally modifying a virus seems to consist in selecting variants by choosing a kind of animal and a kind of tissue, and fostering growth of the virus by artificial propagation. In terms of virus specializations, it appears that a vaccinia virus suitable for inoculating human beings is made by adapting pox virus to calves or rabbits or some other animal highly unrelated to man and further adapting the virus, by skin-to-skin transfer, to a type of specialized cell represented by the skin epithelium, and probably also adapting it to such undifferentiated cells as accumulate in the area of infection. Passing the yellow fever virus through mice by a series of inoculations of brain tissue as the selected source of virus, into the brain as the site of inoculation, results in a virus that has a special affinity for nervous tissue. As the virus becomes highly adapted to the mouse as a host species, its virulence for the mouse is increased, while its pathogenic properties for the unrelated human being are lessened. Likewise, the distemper virus, which is capable of invading members of the weasel, raccoon, and dog families, gains greatly increased virulence for the ferret upon serial passage through that species, and at the same time becomes less virulent for foxes and dogs. Thus, the distemper virus, which has become extremely virulent for ferrets and produces a rapid and highly fatal type of distemper in them, can be injected with impunity into young foxes and dogs as a vaccine.

In the field of virus research we seem at this time to be groping for principles to guide us in modifying viruses so as to convert them to types that can be used as vaccines and as such will produce mild, immunizing infections. From work that has been accomplished thus far, two such principles are evidently emerging. One principle is that the virulence, or invasive powers, of a virus for the human or an animal species can be reduced by highly adapting the virus to some unrelated animal species. The second principle is that a milder infection will be produced by a virus of reduced virulence if the virus is also adapted to grow in a type of cell which will absorb the damage of virus growth with the least harm to the individual as a whole. These two principles seem to underly the changes that have been brought about in viruses in the case of live-virus vaccines used in the control of smallpox, canine distemper and yellow fever. A pox virus, which maintains its character as a vaccinia virus, apparently does so by adaptation to an animal species such as the rabbit, calf, or camel—species highly unrelated to man—and by further adaptation, according to the second principle, to skin epithelium and undifferentiated cells found in the local lesion produced by the virus. The canine distemper vaccine virus, which I have termed a distemper-oid virus, is highly adapted to the ferret, a species rather unrelated to the dog, and is adapted by selection to grow specifically in undifferentiated and lymphoid tissue. The modified virus used in the yellow fever vaccination is a yellow fever virus first adapted to mice, a species highly unrelated to man, and then adapted to the chick embryo, which is much further removed than the mouse in relationship to man, and in addition is not fully developed in species character. In the chick embryo the yellow fever virus is also adapted to growth in types of cells which, in general, have an incomplete differentiation. To a certain extent, modification of a virus is used in the preparation of rabies vaccine. In this case the virus is passed through a rabbit until it is highly adapted, or fixed; but the cellular specialization remains the same as for the original virus, since the virus is propagated in the central nervous system in which the virus also grows in the natural infection. While these principles of virus modification, regarding kind of animal and type of tissue, may not be entirely valid, and certainly are incomplete, they at least form a pattern that may be followed experimentally in efforts to develop new virus vaccines.

An unfavorable feature of the use of modified viruses for immunization lies in the occasional occurrence of complications, sometimes much delayed in their appearance. The paralysis that sometimes develops during the process of rabies vaccination has been described as a mild form of the rabies infection. Postvaccinal encephalitis following smallpox inoculation is well known, and encephalitis has been reported following yellow fever vaccination. However, such postvaccinal effects do not seem to be an inevitable aftermath of vaccination with a live, modified virus, since no such complication has been observed in the inoculation of many thousands of foxes, over a period of several years, with a modified distemper virus. Even the use of killed-virus vaccines, entirely harmless in themselves, may be attended by complications in the presence of an epidemic. When a mink herd is vaccinated with killed-virus vaccine during the course of a distemper epidemic, the epidemic, as such, is controlled, but some of the vaccinated animals continue to die from an acute encephalitis related in some way to the distemper virus. From the information now at hand, it would seem that the ultimate control of virus infections will depend, in large part, on the development and use of live, modified virus vaccines.

The most recent discovery in the field of viruses is one that apparently belongs entirely in the realm of virus diseases. It has been observed that the presence of one active virus infection may prevent the development of a second virus disease upon experimental inoculation. This has been called an interference phenomenon and also a cell-blockade. A virus modified to a point of harmlessness likewise appears to interfere with, or blockade, a more virulent virus of the same kind. The nature of this antagonism is not at all understood, but it would seem that the phenomenon offers tremendous possibilities for development and that highly modified viruses may be found useful in the control of virulent virus infections during an early stage of a disease.

The indefinite status of most of the fundamental problems in the field of viruses is a reflection of the rapid growth of a new science. The field of viruses today would appear to be passing through a surge of development such

as bacteriology went through in the two decades following 1880. The most promising feature of this development is the introduction of two new instruments for use in scientific study: the ultracentrifuge, whereby viruses can be purified; and the electron microscope, by which viruses can be photographed. The knowledge now being developed in the field of viruses must bring into medicine many new procedures and materials for the control of infectious disease.

NUTRITION IN NORMAL ADULTS

JOHN J. BOEHRER, M.D.

Minneapolis, Minnesota

OF all the areas of knowledge which are being explored today there is none which exceeds the field of nutrition in volume of discovery, in heat of controversy, or in the confusion which so inevitably accompanies the working of any such bonanza.

In many respects the present period in the science of nutrition closely resembles the "golden age" of bacteriology, those hectic days of the last two decades of the nineteenth century, when scarcely a year went by without the discovery of the cause of still another disease of mankind. Then, as now, the richness of the vein attracted an army of workers whose polemics enlivened and often cluttered the scientific literature of that day. But from that literature the dross has been refined, and the pure gold of the Pasteurs and the Kochs has built the solid edifice of modern bacteriology.

This analogy is important, I think, because the skeptics who laughed at Pasteur and Koch have their counterparts today. And while their skepticism may be well founded in many instances, it must never be forgotten that Funk, McCollum, Sherman, and many others have built as solid a foundation for the science of nutrition as did Pasteur and Koch for bacteriology, one which cannot be disturbed by even the flood of contradictory and sometimes ridiculous literature which confronts us now.

None of us would deny the role of bad nutrition in the pathogenesis of scurvy, of hunger edema, or of beri-beri. We might disagree regarding the details of the anti-pellagra factor, but none would deny that it is to be found in food. The field of controversy and confusion in nutrition is not here, but rather in what Minot[1] has called "the twilight zone of vitamin deficiency." It is not surprising that this should be so, because the most fundamental questions in this "twilight zone" are still incompletely answered, if at all. For example, even the incidence of marginal deficiency is still a matter of dispute, while the effects of such marginal deficiency are even more obscure.

I submit, however, that if one admits the existence of such frank deficiency states as scurvy and pellagra, then he must also admit the existence, in still larger numbers, of less frank or marginal deficiencies. The fact that we cannot be precise about such subclinical states is not the fault of the vitamins, but of our own present lack of knowledge.

Many of us have become skeptical of the importance of accessory food factors because of our failure to find evidences of any considerable degree of clinical deficiency in our own practices, at least not at all approaching the 40 per cent incidence with which defective diet is supposed to exist in the general population.[2] But I submit again that marginal vitamin deficiency may well be today as mild anemia was before the hemoglobinometer, as allergic disease was before the skin test, or as incipient tuberculosis before the x-ray. There is a limit to the diagnostic power of unaided clinical acumen, and who knows how many obscure syndromes may yield to us when simple, clinical tests for vitamin deficiency are available?

But what of the present? Shall we simply wait for the chemist and the research worker to solve these problems for us? I think we would be betraying our own traditions if we did. And we do not have to. For each of us, no matter how meager his laboratory equipment, has a tool with

From the Department of Preventive Medicine and Public Health and the Students' Health Service, University of Minnesota. Read in the Symposium on Nutrition before the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 30, 1942.

which to deal with these conditions. It is a very simple tool, but one which is too seldom used.

It has been called "diet analysis." To me that is a bad term, because it connotes academic tables of grams and milligrams of this or that, which are entirely unnecessary for our purposes. I prefer to call it simply a "diet history." It can be taken in two or three minutes, and with a little practice, the patient's nutritional status can be evaluated with surprising exactness, barring gross gastro-intestinal disease which may interfere with absorption.

TABLE I. AMERICAN BIG CITY DIET

Food	Amount	Calories	Grams Protein	Grams Calcium	Vitamins			
					A	B	C	D
Potatoes	1 lb.	380	8	0.05	+	+	0	+
Flour, white	1 lb.	1600	50	0.10	0	0	0	0
Meat	½ lb.	350	45	0	0	++	0	0
Sugar	¼ lb.	450	0	0	0	0	0	0
Fat	⅛ lb.	500	0	0	0	0	0	0
Totals		3280	103	0.2	+	++	+	0
Requirements		3000	60	1.0	+++	+++	+++	+++

After Newburgh[3]

This diet history can be obtained by asking only six questions. The first of these is:

1. *How much milk do you drink a day?*

In general, replies to this question will fall into one of three groups: (a) those who only occasionally or never drink milk; (b) those who drink one or two glasses per day; and (c) those who average two or more glasses per day. If our patient is in the third group we can immediately assume the adequate intake of calcium, and probably of riboflavin as well. Those in the second group we must reserve judgment on until further questioning, while those in the first group are to be looked upon with a considerable degree of suspicion. In most instances, the nonmilk-drinkers are very apt to have a distorted dietary pattern, certainly low in calcium, frequently in riboflavin, and often in vitamin A, nicotinic acid, and protein.

2. *How often do you eat meat?*

This is an extremely important question because of the frequency with which a decision in regard to the patient's nutritional status may be made almost on it alone. In general, there are again three categories of replies: (a) those who frankly confess that they dislike meat and eat it only rarely—"once a week" is a common answer in this group; (b) those who eat meat almost every day, but usually only once, and then in very small amounts, averaging one-half a normal portion or less; (c) those who eat at least one normal serving of meat each day.

The individuals in group *c* we can again dismiss, especially if they were also in group *c* under question 1, as having an adequate intake of protein, and as having at least a sizable fraction of their normal requirement of thiamine and iron. Those in groups *a* and *b* are again, however, under suspicion. Those in group *a* in particular include a considerable number of our marginal deficiencies, notably in protein, iron, thiamine, riboflavin, and nicotinic acid.

3. *How much cheese, and how many eggs a week do you eat?*

This question is asked largely as a check on questions 1 and 2, since a few individuals because of dietary prejudices may drink little milk and eat little meat and yet have adequate diets because of their increased intake of cheese and eggs. In general, three ounces of cheese are equivalent to one quart of milk, and three to four eggs are equivalent to a normal daily meat intake.

For most individuals, however, the average answer to this question should be, "cheese once or twice a week as a meat substitute, and five to seven eggs a week." Intakes of less than this lead to suspicion of the adequacy of vitamin A and,

taken in conjunction with the previous questions, of protein, iron, and riboflavin as well.

TABLE II. SIMPLIFIED ADEQUATE DIET

Food	Amount	Calories	Grams Protein	Grams Calcium	Vitamins A	B	C	D
Milk	1 qt.	700	33	12	+++	++	0	+++
Cabbage or other green leaves or fruit	1 lb.	100	5	0.2	+++	+++	+++	+++
Bread, whole-wheat	1 lb	1100	40	0.2	+	++	0	0
Potatoes	½ lb.	200	5	0	0	++	++	0
Fats—butter substitutes, lard, vegetable fats	¼ lb.	1100	0	0	0	0	0	0
Totals		3200	83	1.6	+++	+++	+++	+++
Requirements		3000	60	1.0	+++	+++	+++	+++

After Newburgh[3]

TABLE III. WHOLLY ADEQUATE DIET

Food	Amount	Calories	Grams Protein	Grams Calcium	Vitamins A	B	C	D
Milk	1 pt.	350	17	0.6	++	+	0	++
Cream	3 oz.	210	3	0.1	++	+	0	++
Eggs	2	225	20	0.1	+++	+	0	+++
Fruits and green leaves	1 lb.	115	3	0.2	++	+++	+++	++
Flour, bread, cake, pie	1/3 lb.	550	17	0	0	0	0	0
Meat, fish, poultry	½ lb.	350	45	0	0	++	0	0
Potatoes	1/3 lb.	150	3	0	0	++	++	0
Butter	¼ lb.	800	0	0	+++	0	0	+++
Sugar	2 oz.	250	0	0	0	0	0	0
Totals		3000	108	1.0	+++	+++	+++	+++
Requirements		3000	60	1.0	+++	+++	+++	+++

After Newburgh[3]

4. *What percentage of your bread, flour, and cereals, is either dark or enriched?*

It is well known that one of the chief causes for the progressive deterioration of our diets with respect to their thiamine content has been the increasing refinement in the milling of cereal grains. At least 85 per cent of the B vitamins are removed from grain in the process of making white flour. An attempt is being made to correct this by the enrichment of white flour with thiamine, nicotinic acid, and iron, and, beginning July 1, 1942, with riboflavin. It is unfortunately true, however, that only about half of the flour and cereal grain products sold in this country

TABLE IV. MENU ANALYSIS—PIONEER HALL—BOYS

First Week	CAL	CHO (G)	PRO (G)	Fat (G)	CA (G)	P (G)	FE**	VIT. A*	B_1*	C**	D*	G***
Monday	3489	275.15	105.7	218.5	2.208	2.167	15.65	8658	636	88	123	753
Tuesday	3983	371.00	127.0	222.3	2.429	2.858	22.16	11367	576	71	160	952
Wednesday	4283	459.75	126.3	215.51	2.776	2.765	31.115	10984	528	104	126	884
Thursday	3607	312.00	120.6	208.3	2.008	2.337	22.58	8408	817	63	200	890
Friday	4395	525.00	121.4	201.4	2.679	2.879	26.31	10070	625	30	123	1031
Saturday	4004	390.30	139.5	209.4	2.282	2.636	18.08	7993	734	78	132	916
Sunday	4289	455.40	131.3	216.0	2.012	3.211	13.56	5296	722	63	160	782
Daily Average	4007	398.37	124.5	213.1	2.342	2.693	21.35	9968	662	71	146	886
Requirements	3000		70		.8	1.32	12.00	5000	600	75	300	600
Second Week												
Monday	4158	439.4	116.6	214.9	2.460	2.599	22.15	6239	825	156	124	909
Tuesday	4001	386.4	137.4	220.2	2.224	2.617	20.63	8370	570	25	120	927
Wednesday	4811	521.9	140.1	240.3	2.590	2.912	25.13	17018	884	135	151	1362
Thursday	3335	257.3	126.0	200.2	2.383	2.628	17.94	9949	557	65	166	386
Friday	3608	352.94	123.65	189.1	2.287	2.119	15.41	8046	633	79	128	770
Saturday	3729	380.25	125.3	189.7	2.262	2.564	30.11	8137	487	118	126	926
Sunday	3822	309.40	126.9	230.8	2.330	2.373	15.09	9350	662	75	166	1288
Daily Average	3924	378.22	128.0	213.2	2.362	2.463	20.92	9587	659	93	140	938
Requirements	3000		70		.8	1.32	12.00	5000	600	75	300	600
Two-Week Average	3966	388.30	126.3	213.2	2.352	2.578	21.14	9778	661	82	143	912

*International units **Milligrams ***Riboflavin—Sherman-Bourquin units

Boehrer[1]

are at present so enriched. It follows, therefore, that question number 4 has a dual purpose. In the first place, the very asking of the question serves to publicize and to increase the demand for enriched cereal grain products, without which the public-spirited miller operate at a distinct disadvantage with his less social-minded brethren. Secondly, the patient who states that at least half of his intake of these products is either dark or enriched may almost surely be assumed to have at least the minimal intake of thiamine. With less than this, especially in conjunction with a diminished intake of milk and meat, deficiency in this important vitamin may be presumed, and the adequacy of nicotinic acid and riboflavin questioned.

5. *How many servings of fruit and vegetables do you eat each day?*

In general, the optimal intake of these important food sources may be considered as two servings of fruit and four servings of vegetables each day. Attempts are often made to subdivide these into individual requirements of citrus as against other fruits, of legumes, leafy, and yellow vegetables, but for our purposes I think it is safe to assume that given two servings of fruit and four vegetables each day that natural selection will usually take care of the correct distribution.

The fruits and vegetables are chiefly important, of course, as our richest source of vitamin C, and the rather frequent dietary histories of only occasional fruit and one vegetable per day are presumptive evidence of vitamin C deficiency. In addition, the fruits and vegetables are important as supplementary sources for almost every other mineral and vitamin. This is particularly true of vitamin A, the vitamins of the B complex, protein, calcium, and iron. Diets inade-

TABLE V. MENU ANALYSIS—COMSTOCK HALL—GIRLS

First Week	CAL	CHO (G)	PRO (G)	FAT (G)	CA (G)	P (G)	FE**	VIT. A*	B_1*	C**	D*	G***
Monday	2880	279.1	84.7	158.7	1.279	1.620	26.56	3948	788	89	68	705
Tuesday	2891	294.1	77.2	155.2	1.328	1.490	14.13	7600	544	68	90	497
Wednesday	2714	236.8	76.5	132.0	1.452	1.700	26.32	4532	543	72	31	494
Thursday	3395	317.5	97.1	191.8	1.250	1.821	16.94	5542	407	62	100	417
Friday	2529	266.7	64.5	132.4	1.215	1.262	11.95	4952	351	82	281	427
Saturday	2863	323.6	74.0	148.7	1.301	1.497	11.14	6936	378	90	140	631
Sunday	2824	283.9	79.3	151.6	1.326	1.723	14.75	5647	428	67	138	530
Daily Average	2866	285.9	79.0	152.9	1.307	1.587	17.39	5593	491	75	121	528
Requirements	2500		60		.8	1.32	12.00	5000	500	70	300	600
Second Week												
Monday	2657	291.1	88.1	141.3	1.207	1.752	18.11	6084	310	43	106	568
Tuesday	3306	350.6	86.8	172.9	1.404	1.688	14.33	11433	886	78	106	589
Wednesday	3436	311.5	92.1	119.2	1.215	1.555	17.96	16065	508	110	110	1373
Thursday	2559	271.0	81.9	128.45	1.203	1.477	13.82	10066	417	99	100	570
Friday	3220	368.9	81.5	157.1	1.538	1.710	13.31	5173	380	90	71	533
Saturday	2525	222.9	92.7	135.8	1.198	1.560	14.37	5626	406	100	106	692
Daily Average	2950	302.6	73.5	142.4	1.294	1.623	15.31	9074	484	86	99	720
Requirements	2500		60		.8	1.32	12.00	5000	500	70	300	600
Thirteen-Day Average	2908	294.3	76.3	147.7	1.301	1.605	16.35	7334	488	81	110	624

*International units **Milligrams ***Riboflavin—Sherman-Bourquin units

Boehrer[1]

quate in these foods inevitably mean border-line diets at least, and when combined with other inadequacies are pathognomonic of vitamin deficiency.

6. *How much butter do you eat each day?*

It has long been realized of course that butter is one of our richest sources of Vitamin A. The work of Burr and his collaborators,[3] however, has emphasized that butter and other natural fats are essential not only because of their vitamin content, but because they are our source of linolenic and other unsaturated fatty acids which are apparently as essential to our life and well-being as any vitamin. It is realized of course that in certain areas of the country not as fortunate as Minnesota, other fats may have to serve as butter-substitutes, but in this region we may well look upon butter intake as a fairly accurate index of fat consumption. For our purposes we may consider a daily consumption of six squares of butter as an index of an adequate fat intake. Less than this, unless it is compensated for by unusually large intakes of cream, cheese, meat, and eggs, indicates a borderline daily ration of vitamin A and fat.

Some of you may object at this point that such a dietary pattern as I have described is the normal pattern for our people, and that departures from it are so rare that the routine taking of such a dietary history would be a waste of time. I can assure you that such is not the case. The causes for such deviations include not only poverty, but ignorance and faddism.

Newburgh, for example, has tabulated the average large-city diet in the lower classes as shown in Table I.

Contrast this with the dietary pattern of a minimum-cost adequate diet (Table II).

Or in terms of a diet of somewhat greater cost (Table III).

TABLE VI. EXTENT OF DIETARY DEFICIENCY
Per Cent of Diets Adequate in Each Dietary Factor

	Calories	Protein	Calcium	Iron	A	B_1	C	G
Low Income—Boys	31.8	84.8	86.4	75.8	68.2	12.1	18.2	19.7
Low Income—Girls	36.4	68.2	68.2	36.4	40.9	13.6	18.2	4.5

Boehrer[1]

TABLE VII. AVERAGE DIETS—ALL GROUPS

	Calories	Protein	Calcium	Iron	A*	B_1*	C**	G***
Low Income—Boys	2823	72.7	1.178	14.65	6395	464	58	508
Pioneer Hall	3966	126.3	2.352	21.14	9778	661	82	912
Low Income—Girls	2247	67.5	.881	11.40	4960	351	55	371
Comstock Hall	2908	76.3	1.301	16.35	7334	488	81	624

*International units **Milligrams ***Riboflavin—Sherman-Bourquin units.

Boehrer[1]

TABLE VIII. DIETARY PATTERNS OF DORMITORY AND EXPERIMENTAL GROUPS

	Milk	Cheese	Eggs	Meat	Vegetables	Fruit	Per Cent Dark Grains
Dormitory	6 glasses	.44 oz.	.6	1.84 serv.	4 serv.	2.8 serv.	50%
Exp. Group	2 1/3 glasses	.15 oz.	.2	1.5 serv.	2.6 serv.	1.4 serv.	25%

These dietary patterns, while exaggerated, are nevertheless indicative of the wide range of diets habitually eaten by great numbers of our population.

Furthermore, it is an error to believe that such diets are only eaten by the lowest strata of our society. During the past year, for example, we have been greatly interested in examining the nutritional status of our student population at the University of Minnesota. Our first step was to analyze the diets provided for the students housed in our dormitories, representing 7 per cent of our student population, and economically somewhat above the average. These were found to be excellent diets, considerably above the nutritional standards.

When we analyzed the diets of another group of students, however, an entirely different picture was found. In this group of 88 students, representing at least 25 per cent of our student population, not a single student was found to have a completely adequate diet, and 11 per cent of them had diets inadequate in each of the eight factors studied. The details of these studies have been published elsewhere.[1]

In addition to these detailed analyses, we also carried out studies of these diets along the lines which I have described to you. The results of these may be tabulated as shown in Table VIII.

The reflection of their detailed dietary inadequacy in terms of the simple history is clearly seen.

It might properly be asked on what basis we assume that such diets as found in our experimental group are truly inadequate, in the sense of a resulting diminution in health and vigor. This question of course goes to the root of much of the controversy in the whole field of nutrition, and is the problem which we are attempting to solve in part in our studies at the University of

Minnesota. Our findings in this respect are thus far incomplete. I can say, however, that 20 per cent of this group have diminished capillary integrity, as measured by the cuff test, and that 35 per cent of them show an abnormal degree of vascularization of the cornea as seen with the slit lamp. Thus even with these relatively crude tests, definite physical abnormality was demonstrable.

In conclusion, I should like to reiterate my plea for your tolerance of the often groping efforts of the fundamental workers in this field. If we can on the one hand be critical of the extravagant claims of those whose chief interest in the vitamins is commercial exploitation, and if on the other we will conscientiously search for evidences of dietary deficiency in our patients, in our physical examinations and especially in our histories, we will be doing not only them but the science of nutrition an inestimable service.

Bibliography

1. Boehrer, John J.: Nutrition problems in college students. Journal-Lancet, 63:40-47 (Feb.) 1943.
2. Burr, George O., and Burr, Mildred M.: New deficiency disease produced by the rigid exclusion of fat from the diet. Jour. Biol. Chem., 82:345, 1929.
3. Newburgh, L. H.: Normal nutrition. Canad. Med. Assn. Jour., 40:491, 1939.
4. Salter, W. T.: Medical progress: The chemical measure and control of clinical vitamin deficiency. New Eng. Jour. Med., 226:649, (April 16) 1942.
5. Stiebeling, Hazel K., and Phipard, Esther F.: Diets of families of employed wage earners and clerical workers in cities. U. S. Dept. Agriculture Circular 507, Washington, D. C. January, 1939.

FOOD PREPARATION AND PRESERVATION

EVA DONELSON

University of Minnesota

Minneapolis, Minnesota

A NEW ENGLAND woman years ago refuted suggestions for the improvement of her diet by saying, "I'd ruther eat what I'd ruther." Today we say the same thing and furthermore we practice it.

The challenge then is to "ruther" eat those foods which, in so far as we know, today, are recommended to be included in a good diet. One of the battles to be fought at this juncture is that of preparing those good foods by methods such that they continue to be good foods even though exposed to the vicissitudes of the pot and the pan.

Are there any pertinent suggestions as to methods of food preparation that will help to conserve the original food value as well as produce a palatable product?

In the preparation of the food for cooking a precaution is issued, relative to the use of the green, outer leaves of a food such as cabbage. The extreme outer leaves are always the most green, as for example in cabbage, and consequently good in food value, but in addition if an excess of spray, usually arsenic or lead, happens to have remained there, the consumer gets more than a bargain, ironically speaking, for he not only gets vitamin A, calcium and iron, characteristic of green vegetables, but also unfortunately arsenic and lead. So the wiser practice would seem to be to discard those few outer leaves on vegetables.

Sometimes less preparation and manipulation than more contributes to the food value. For example, sauerkraut that is stored in the jars or vats in which the fermentation took place is found to be higher in vitamin C content than that which has been disturbed to the extent of canning it after fermentation in fruit jars, a common practice. That manipulation furthers the loss of carbon dioxide which contributes to the loss of the vitamin. It should be noted that sauerkraut immediately after fermentation is almost as good a source of vitamin C as the original cabbage. During storage there is a gradual loss of this vitamin; and as indicated the rate of this loss increases if the product is repacked.

Another example is the merit of using the whole potato, peeling and all. Potatoes not peeled lose less of the nutritive elements on cooking than the peeled ones and since with the skins on they are higher in food value to begin with, the combination of less loss from a food higher in food value, indicates that whenever feasible potatoes "in the jackets" should be on the menu. The flavor too is different.

It is better not to strain the orange juice for

Presented at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 30, 1942.

breakfast. The pulp that is removed and subsequently thrown away is higher in food value than the juice that is retained.

Nature seems always to be with the housewife. The more simple she makes her food preparation operations, the better table she may set from the health standpoint, within limits. For there is at the other extreme, the person on a marginal allowance who limits the food supply for the family by purchasing from the delicatessen and her operations consist of wielding the can opener, for the fruits and vegetables, and the butcher knife to slice the prepared meat and bread. To stretch the budget, home preparation of foods is of signal importance. With food prices up 20 per cent (as of March, 1942) a vigilant eye must always be open for procuring the dollar's worth of food value. Furthermore and in addition to the economy factor, to spare those foods on the grocer's shelf which are well preserved, is our patriotic duty. It should be the aim of all food purchasers to use to their fullest capacity those fresh foods in season and especially those foods grown in the locality of their residence. Help yourself by using them in your meals, for fresh foods taste better than those preserved in any way; help the grower who has increased production in compliance with the request for increased production; help our allies by sparing the canned and dried products that can be shipped; help free transportation facilities by using products grown in your locality.

For the preparation of foods, some hints have been summarized by the Bureau of Home Economics:

1. Don't use soda in cooking green vegetables. Why not? It destroys thiamine and ascorbic acid. What difference does that make? It is difficult to attain the thiamine level in the dietary recommended by the National Research Council unless every opportunity is taken to conserve that factor. Vitamin C is the least stable nutrient in the dietary. Production figures indicate that not enough citrus fruits and tomatoes were grown last year to supply the needs of the population of this country. Now with wartime needs superimposed, it is clearly evident that supplementary sources must be called upon and one of the good ones is green vegetables.

2. In boiling vegetables, return the temperature to the boiling point as rapidly as possible after the addition of the food. That too is for the purpose of conserving vitamin C. There is in vegetables oxidative enzymes which facilitate the loss of this vitamin. High temperature will destroy the enzyme; the more quickly this can be done the smaller the loss of this vitamin.

3. Use as little water as possible in boiling foods. That procedure conserves water soluble elements, minerals and vitamins. A recent piece of work from Cornell University, in New York State, demonstrates that fact clearly for vitamin C. In a previous study they boiled peas using approximately 1 cup of water to 1 cup of peas and the peas retained 59 per cent of the original vitamin C value; in the present study the measure of peas to water was approximately 3 to 1—that is much less water. The peas retained 75 per cent of the original amount—a notable difference. Whether the container was covered or not made no difference in this loss in this carefully done study.

4. Save the water in which vegetables have been cooked. Use it in gravies, sauces and soups. If the precept of using less water is followed there will be very little vegetable water to use and the flavor of the food is excellent. Steaming saves the nutrients and results is a palatable product.

5. Prepare chopped fruit and vegetable salads shortly before serving. Chopping non-acid vegetables releases those oxidative enzymes previously mentioned which allow for the destruction of ascorbic acid. Shredded cabbage, it was found by investigators at the University of Montana, loses from 15 to 40 per cent of its vitamin C content when allowed to stand for one hour at room temperature. Broccoli loses 35 per cent standing three days at room temperature. Spinach, not chopped, loses practically 100 per cent of the vitamin C when stored at room temperature for one week. Refrigeration checks that rate of loss. This same loss is not manifested in acid foods. In fact orange juice shows no loss from standing overnight in the refrigerator and little loss at room temperature.

6. Start cooking frozen foods while still frozen. All cooking times are shortened for frozen foods.

7. Serve raw frozen foods immediately after thawing. The process of freezing does not destroy the bacteria but merely delays their activity. With the cells of food material broken by the freezing the medium for their activity is rich and they take advantage of it. Spoilage ensues quickly.

8. For meats slow cooking is most satisfactory.

9. For baking, the recommended modifications of the usual recipes for the use of sweetening agents other than sugar result in most acceptable products. They are:

Honey: Replace sugar with honey cup for cup, but use one-half the other liquid called for. That is, if the original recipe calls for 1 cup sugar and 1 cup milk, use ½ cup honey and ½ cup milk. Other ingredients remain the same. Lower the baking temperature, keeping the oven moderate. Mixtures made with honey not only brown very easily, but high temperatures tend to change the flavor of the honey.

Corn, Cane or Maple Syrups: Replace sugar with syrup, measure for measure and reduce liquid only one-third. Cookies made with corn and cane syrup are not as sweet as sugar cookies.

Sorghum syrup: Follow the same rule as with the other syrups, but reduce the baking powder called for in the original recipe. Use ½ teaspoon of soda for

every cup of sorghum. This quantity of soda and sorghum has the leavening power equal to two teaspoons of baking powder.

Molasses is high in calcium and iron content; a valuable asset to the diet. We have much to learn from our neighbors to the south. They like it; so should we.

Food Preservation

That no foods be wasted from garden patches, berry bushes or fruit trees this year, preservation is the solution. The same holds true for meat at the time of butchering. We will eat what we can while fresh; we will preserve or store the remainder. A commendable activity of which I recently heard is that of the Federated Women's Club in the 5th district. They plan to obtain from farmers fruit and vegetable crops that they are unable to sell at the time and which would mean spoilage and to can these products and hold them in reserve for distribution during the year through established agencies where a need exists.

In general the possible methods for preserving foods are by canning, freezing, drying and storage. Certain techniques and precautions are necessary for the attainment of a satisfactory product by any of the methods. Through the Superintendent of Documents in Washington, D. C., bulletins can be obtained as follows:

Community Food Preservation Centers. Miscellaneous Publ. No. 472, U. S. Dept. Agriculture, Washington, D. C. 10 cents.

Home Canning of Fruits, Vegetables and Meats. Farmers' Bull. No. 1762, U. S. Dept. Agriculture. 10 cents.

Farm and Home Drying of Fruits and Vegetables. Farmers' Bull. No. 984. 5 cents.

Ways to Save Sugar When You "Put Up" Fruit. Bureau of Home Economics, U. S. Dept of Agriculture.

Consult your local county agent about the following prepared and distributed through the Agricultural Extension Division at the University Farm, Saint Paul:

Using Less Sugar for Canning, Preserving and Freezing Fruits. Extension Pamphlet 100.

Preserve Garden Products by Drying, Waxing and Brining. Extension Pamphlet 102.

Home Canning Fruits and Vegetables. Extension Pamphlet 100.

Preparation of Fruits and Vegetables for the Frozen Food Locker. Extension Pamphlet 79.

For Health this Winter Store Vegetables. Extension Pamphlet 101.

The food value of foods preserved and stored according to the methods set forth in the above listed pamphlets is not to be underrated. But in order to be sure that you are alive and well enough to enjoy these benefits, it is recommended that all non-acid vegetables and meats, home canned, be boiled fifteen minutes before tasting, as this removes the danger of botulism. It is also a good rule never to taste raw sausage, a hard precept for good sausage makers to follow, for the danger from trichinosis is vague to them. From earlier discussions it was indicated that vitamin C is the least stable food factor. Those foods on which we depend most for vitamin C, are as rich immediately after canning as the fresh, but there is loss on storage. Tomato juice whether home or commercially canned may be as rich in ascorbic acid as the fresh product. There does seem to be one precaution and that is that the head space in the jar be kept to a minimum. For although the vitamin is preserved in acid, it has been observed that an abnormally large headspace with a consequent inclusion of oxygen results in oxidation of some of this vitamin. Also, if you wish the vitamin C in your tomato juice, you will not boil it down to thicken it, but drink it thin. So closely identified with acidity is vitamin C that when a tomato juice tastes flat due to low acidity it has been found to have a low concentration of the vitamin. In the nonacid vegetables there is loss of both vitamins C and thiamine in canning. Vitamin A is very stable as is G.

Freezing causes no more destruction of vitamin C in vegetables if the product is blanched before freezing, than does the ordinary cooking process. The fresh cooked and frozen cooked peas for example are equal in vitamin C value. Other food factors have not been studied so extensively.

Interest, perforce, in dried and dehydrated fruits and vegetables has been increasing. The difference between drying and dehydrating is that the latter method entails controlled conditions of temperature, humidity and air velocity, the former only semi- or uncontrolled conditions. An advance over the earlier procedures used for drying is the recognition that as with freezing, for most vegetables, blanching before drying is necessary to retain not only the more nearly natural flavor but also the food value. Tressler indicates in his thorough review of the literature on the nutritive value of dried foods,

done for the National Research Council, that "vegetables retain their vitamin C well if stored in the absence of air." Air-tight cans are recommended by our Extension Divsion for the storage of these products. Tressler continues to state, "It is probable that storage in an inert atmosphere aids also in the retention of carotene. Dehydrated fruits retain vitamins, particularly carotene and vitamin C, much better than those which are sun dried. Sulfuring of fruits aids in the retention of vitamin C but causes the almost complete destruction of the vitamin B_1 content." It was concluded that "the best means of preparing and storing dehydrated vegetables and fruits of high vitamin content are still lacking." It should be mentioned at this point that the Office of the Experiment Station will launch next year into a coöperative study tremendous in scope through the Experiment Stations in the Colleges of Agriculture throughout the country, to study the nutritive value of foods. It is cooperative through Divisions on a given campus such as Horticulture, Dairy, Animal Husbandry and Home Economics as well as between states. They will study the effect of variety, conditions of production, preparation, preservation and storage on the palatability and nutritive value of foods. In a few years, a report similar to the one that I have attempted to present today, will be much more extensive and much more conclusive.

Food is a strategic war material and it must be saved. It must be prepared so that not only are the food nutrients preserved, however, but also so that it is palatable. So when foods are in season, use as much as possible in the fresh state; preserve them by some method such as canning, drying, freezing or storage. That is the responsibility of every person charged with the feeding of a family or group. No foods can be wasted in garden patches, on berry bushes or fruit trees this year. Commercially preserved foods must be spared for lease-lend and the army; the home larder should be filled by the homemaker. The civilians too need more food than duirng pre-war days because more persons are engaged in active work. To provide food for the Allied Nations, farmers have stepped up their production; consumers can march with them by curtailing the waste of all food, by careful preparation and increased preservation.

THE EARLY TREATMENT OF INJURIES TO THE FACE AND NECK

GORDON B. NEW, M.D.

Rochester, Minnesota

THE early treatment of injuries to the face and neck involves (1) first aid, (2) the transportation problem, (3) the treatment at the hospital or if in service at the advanced clearing station, and (4) the treatment at the base or general hospital.

First Aid

First aid in the care of injuries of the face and neck consists of the control of pain, hemorrhage and pharyngeal obstruction.[1] Bleeding may be caused by injury to a vessel about the face or jaws. One of two methods can be employed in its control: (1) the use of external pressure on the carotid artery in the neck, on the facial artery over the margin of the jaw, or on the superficial temporal artery in front of the ear; (2) packing of the wound. It may be necessary to use the blunt end of a stick to separate the teeth in order to open the mouth for examination of the bleeding point. If packing is employed, gauze or a handkerchief can be used. If the bleeding is from the jaw and is severe, it may be necessary to bind the jaws together with a scarf or a bandage looped over the head and beneath the chin in order to exert enough pressure on the packing to control the bleeding.

Pharyngeal or laryngeal obstruction may be caused by blood running back into the pharynx and collecting in clots, or by the tongue falling

From the Section on Laryngology, Oral and Plastic Surgery, The Mayo Clinic, Rochester, Minnesota. Presented before the Mississippi Valley Medical Society, Quincy, Illinois, September 30, 1942.

back against the posterior pharyngeal wall—the latter being the result of a bilateral fracture of the lower jaw. The clots can be removed with the index finger in order to clear the pharynx. Lowering the patient's head or holding the head forward so that blood will drain out of the mouth is preferable to allowing it to run into the pharynx or larynx. The tongue can be pulled forward with the finger and thumb in order to relieve pharyngeal obstruction and it may be necessary to hold the tongue in this position until other suitable measures are available. If a silk suture on a needle is available, this can be passed through the anterior part of the tongue in the midline and stuck to the chin and neck with adhesive plaster, thus holding the tongue in protrusion.

If the lower jaw is fractured, a scarf or a large handkerchief tied over the top of the head and beneath the chin will hold the fragments of the jaw in position against the upper teeth and relieve the pain. The mouth and the pharynx should be examined carefully for the presence of any loose teeth, in order that they may be prevented from falling into the larynx or lung.

Blood or any gross dirt of the road can be removed from the soft tissues of the face with water, to permit more careful inspection.

Loose flaps of skin about the face should be set back as nearly as possible in their normal position. This is particularly true if there is any angulation of the pedicle of a flap. Adhesive plaster is a great aid in holding the flaps or margins of the wound together. Search should be made for any large pieces of skin that may have been cut off or torn away, as it is possible that these may be employed later to cover the raw surfaces. If a part of the nose or ear has been cut off it should be saved, no matter how dirty it is, as it may be possible to clean it, suture it in place and apply pressure by means of a dressing, or at least the cartilage may be utilized later in reconstruction if it is preserved in an ice box.

In wounds of the neck, gauze packing and pressure dressings to control bleeding may be necessary. Crystals of sulfanilamide may be placed directly in the wounds in either the neck or the face.

In the first-aid treatment of burns, the Conference on Burns of the National Research Council has given the following directions:

First-aid Therapy.—The hands and face are to be covered with an aqueous emulsion containing 5 per cent of sulfadiazine, or, if this is not available, with boric ointment. These surfaces are then to be covered if possible with a fine mesh gauze (44) and a firm pressure bandage using cotton waste should be applied to the hands. No bandages should be applied to the face.

The eyes, if treatment is necessary, should have a single instillation of ophthalmic ointment containing 2 per cent of butyn sulfate. The patient must be warned not to rub his eyes once this anesthetic agent has been applied; otherwise the cornea may be severely injured.

The Transportation Problem

It has been well said that a live patient in a ditch or in a nearby farmhouse is better than a dead one that has been transported to a hospital. In other words, an injured patient has a much better chance of recovery if he is taken care of as near the accident as possible than if he undergoes a long trip to a hospital. The transportation problem of those injured about the face and neck involves supporting the lower jaw and preventing respiratory obstruction while the patient is being transported. A suture into the tongue or a rubber anesthetic tube inserted into the nose and carried into the hypopharynx holds the tongue forward and gives a free airway. The patient should sit up with the head forward so that any blood will run out of the mouth. If he cannot do this, he should lie on his stomach. If the patient has an injury to the jaw or pharynx and there is any bleeding, the pharynx and the trachea may become obstructed because of blood running into them.

Advanced Hospital or Clearing Station

Shock should be treated as soon as possible by stimulation and heat and the use of blood plasma.

Further cleansing of the wounds may be done, and hemorrhage controlled by ligation of vessels if necessary. Débridement is carried out and careful suturing of the wounds of the face or neck may be attempted. This should not be done, however, unless there is good illumination and unless fine needles and suture material are available. Large needles and heavy suture material frequently produce much scarring that is almost impossible to take care of later. It is much better to hold the flaps or margins of the wound together with adhesive plaster until accurate ap-

proximation of the edges of the wound can be made in the hospital where the necessary equipment is present.

At times, it is best to delay repair of facial injuries because of the serious condition of the patient. This may be due to fractures in the frontal region or of the base of the nose extending into the ethmoid region, or to an injury in some other part of the body, such as an extremity, the thorax or the abdomen. Sulfathiazole is placed directly in the wound and given internally in cases in which there is injury of the ethmoid region and frontal region, and the patient is observed for a time, sometimes without closure of the wound. In general, however, the sooner the soft tissues are sutured, the better the result.

Satisfactory results are obtained in the immediate care of the soft tissues of the face when the treatment consists of proper débridement, excision of the ragged and lacerated margins of the skin, complete hemostasis, adequate drainage, use of a minimal amount of fine catgut, approximation of the margins of the wound with fine silk sutures placed close to the edges and the application of a pressure dressing to prevent hematoma and hold the flaps in position. The use of granulated sulfanilamide or sulfathiazole placed directly in infected wounds is one of the great advances in the care of facial injuries.

If the injury is severe, fractures should always be excluded by roentgenologic examination. Care of bony defects may be delayed until the swelling of the soft tissues has become reduced. Free drainage for all wounds of the jaw or floor of the mouth is essential in order to prevent a phlegmon in the neck. This is best done by nicking the skin and mucosa, carrying curved forceps through from the neck into the floor of the mouth or outside the lower jaw and passing a Penrose drain through this channel, making through-and-through drainage. The ends of the drains may be fixed with silk at the corner of the mouth. A dentist is of great aid in the use of wires and splints to fix the fractures of the upper and lower jaw and should be part of every team caring for injuries of the face and neck.

Definitive Treatment of Burns.—Dressings are to be removed and first the surfaces of the burn and then the surrounding skin cleansed with soap and water, using pledgets of cotton and nothing else. Do not scrub the burned surface.

After cleansing, rinse the surface freely with physiologic salt solution. Open the blisters and remove all necrotic epidermis under the best possible aseptic precautions and minimal trauma. The aqueous emulsion containing 5 per cent of sulfadiazine or boric ointment is then to be generously applied to the burned area and covered with fine mesh gauze. The pressure dressing on the hands should then be reapplied, but the face should not be covered. The dressing should be changed only when necessary.

In third degree burns, at the time of redressing, crystalline sulfanilamide should be applied. As soon as the granulating surface is reasonably clean, skin grafting should be performed.

Base or General Hospital

While the care of the soft tissues of the face and neck should be seen to as soon as possible, there need be no hurry about the care of the bony structures of the face. Sometimes it is best to delay several days until the swelling has become reduced considerably before one attempts to put the bones into correct position and to have the dentist wire the teeth together to fix them in their correct alignment. The repair and restoration of the lost tissue by means of grafts, flaps and other plastic procedures should be carried out. In general, it is best to delay the final plastic work for about six months and allow the scarring and thickening to go down as much as they will after as much as possible has been done at the time of the primary care.

Following injury about the neck, if there is some trauma to the larynx and pharynx, edema may develop and this may necessitate tracheotomy. If examination shows some laryngeal obstruction which is progressive, tracheotomy should be performed early. If one waits until there is definite laryngeal obstruction or still longer, until there is marked laryngeal obstruction, then changes occur in the trachea and lung which are usually followed by pneumonia. Early tracheotomy involves very little risk. It is best done by dividing the isthmus of the thyroid and placing the tracheal tube about the second tracheal ring. If stricture in the larynx or trachea follows an injury and necrosis of the cartilage, a skin graft may be used later to make a new airway, so that the tracheotomy tube can be dispensed with. It is usually best to wait six months before one attempts this type of plastic operation.

If bleeding necessitates ligation of the external carotid artery, one should do this as early as possible rather than wait until the patient has had a great deal of bleeding. The incision in the neck should be a curved one, following one of the wrinkles in the neck, extending from just above the thyroid cartilage to below the angle of the jaw. The skin, superficial fascia and platysma muscle are freed up and the upper flap is retracted by means of ligation retractors. The anterior margin of the sternomastoid muscle is exposed and when this is turned back, the jugular vein and carotid artery may be exposed by blunt dissection using a small hemostat. The branches of the external carotid artery should be demonstrated before one carries the silk suture about it. The pulse of the facial or temporal arteries should be tested out before the suture is tied.

References

1. Ivy, R. H.: Plastic and maxillofacial surgery. S. Clin. North America, 21:1583-1592, (Dec.) 1941.

PAIN AS A SYMPTOM IN APPENDICITIS

R. A. GLABE, M.D.

Plainview, Minnesota

GENERALLY we speak of generalized and localized types of pain in acute appendicitis. In the presence of an acute condition of the abdomen with generalized pain in which we suspect acute appendicitis, we are altogether too wont to assume the attitude of *laissez faire* and await the development of localized pain at McBurney's point, and arrive later at a diagnosis difficult to miss. A finer understanding of the mechanisms causing pain might well be reviewed to refresh our knowledge and make for quicker, surer diagnoses of acute appendicitis.

Pain varies in appendicitis because the source of stimulation varies. The initial generalized pain arises from the appendix itself due to distention of the organ and the later localized pain arises from stimulation of the parietal peritoneum by the spreading inflammatory process. Ordinary forms of stimulation such as touch, temperature (except in extremes) and chemicals cause no sensation in the alimentary canal from the middle or lower third of the esophagus to the upper end of the anal canal. Distention of the viscus is the stimulus which produces this visceral pain which arises as a result of the stretch stimulus applied to the nerve terminals in the wall. This pain is only roughly localized to the viscus itself or is referred (Hurst).

A brief review of the neuroanatomy might be in order. The tenth thoracic to probably the first lumbar spinal segment are generally accepted as being the primary receptive center for the appendix. These visceral autonomic afferent fibers form a part of the splanchnic nerves of the sympathetic nervous system supplying the viscera only and not the parietal peritoneum, abdominal muscles, or skin. The appendix has a bilateral splanchnic supply. The peritoneum, having an entirely different innervation, has a somatic body supply, is segmental and corresponds with the muscle and skin.

Sheehan, studying the nerves of the mesentery, found three types of fibers.

1. Afferent sympathetic fibers traveling in the splanchnic nerves ending in the Pacinian corpuscles scattered throughout the mesentery.

2. Free nonmyelinated afferent and efferent sympathetic fibers terminating in the serous covering of the bowel and providing for the transmission of true visceral pain.

3. Free myelinated fibers probably derived from somatic nerves, but probably not extending in the mesentery as far as the serous covering of the bowl itself.

The parietal peritoneum is therefore sensitive to cutting and tearing while the viscus itself containing only autonomic afferent nerve fibers is insensitive to stimuli of these types.

Considering referred pain it will be remembered that a given spinal segment supplies a visceral area with autonomic nerve fibers and a well-delineated area of skin, muscle and peritoneum with somatic nerves. Though closely

Presidential Address delivered at annual meeting of the Wabasha County Medical Society, Lake City, October 8, 1942.

linked in the spinal cord, the two types of structures may be some distance apart due to embryological development and rotation.

Concerning the visceral pain, evidence seems to show that contraction of the muscular wall of a hollow viscus does not of itself give rise to pain. Rather pain arises if the contraction causes distention of a neighboring portion of the wall, which might be the case if part of the wall is in spasm or a mechanical obstruction exists. Poulton found a peristaltic wave approaching a balloon inserted into the lower part of the human esophagus caused pain while during its passage over the esophageal wall in contact with the balloon this sensation did not exist. He ascribes the absence of pain during the passage of the contraction wave to the reduction in the diameter of the tube and the subsequent release from stretch of the nerve endings lying between the muscle fibers. Pain also ceased if the esophageal muscle relaxed to accommodate the balloon, adjusting the length of its fibers to the distending force.

Wangensteen and his co-workers in studying the etiology of acute appendicitis noted that the ingestion of food appeared to raise the basal level of pressure and increased the amplitude and frequency of the waves of contraction of the appendix.

They also noticed that a rupture of a rabbit's appendix was hurried considerably by the intravenous infusion of hypertonic saline solution or the oral administration of croton oil, probably largely an effect of fluid secretion—the muscle contraction being less responsible than the dilating force of the secreted fluid. It appeared to them that the interference with the blood flow resulting from maintained intraluminal pressure exceeding the capillary pressure brought about the necrosis of the wall at a lower intraluminal pressure than a normal organ.

Birdshot placed in an appendicostomy stoma caused one of their patients to suffer cramps as the shot progressed toward the cecum. The cramps ceased after the shot had passed the appendical sphincter at the cecum. Distention of the human appendix by the injection of fluid through an appendicostomy opening caused severe pain referred to the region of the umbilicus.

The preceding anatomical and experimental data give us a basis for the logical explanation of appendical pains. At the onset of the disease there is nearly always some luminal obstruction due to an overactive sphincter, fecalith, fecal matter, or anatomically narrow lumen of unknown cause, and the organ is caused to swell due to normal secretions of epithelial cells as well as inflammatory exudate. The muscle fibers are put on the stretch, causing the visceral type of pain—diffuse, boring without accurate localization, perhaps roughly localized in the region of the umbilicus or left upper quadrant, no elevation of temperature, no hyperesthesia, spasm or rigidity. This is true visceral viscus pain. As this process progresses the peritoneal serous covering and parietal peritoneum become inflamed and with it develop localization of the pain, hyperesthesia of the skin, reflex rigidity of the muscles and systemic signs such as fever and leukocytosis. The peritoneum is involved and any movement—walking, coughing, or deep respiration—brings about tenderness and reflex spasm of the muscles to pressure. Pain and tenderness resulting from pressure upon the inflamed appendix is localized, probably because the infected roughened organ comes in contact with the parietal peritoneum (Morley). Relief from pain of a ruptured appendix is brought about by the release of the stretch reflex, and the continued rigidity is explained by the continuous parietal stimulation of the somatic nerves by the appendical and peritoneal exudate.

Initial attacks of acute appendicitis of a typically situated appendix are easier to diagnose. Difficulties arise when the appendix is retrocolic, retrocecal or especially retroperitoneal. The retroperitoneal case presents more possibilities of complications, because the sensitive peritoneum is not so readily stimulated. The second or somatic localizing pain may be entirely absent and the physician may operate depending on the physical finding of tenderness and rigidity in the right lumbar region. Another cause for difficulty exists in the acute excerbation of an appendix with previous attacks and surrounded by bands of scar tissue, which is not so readily stimulated as the normal peritoneum. In these cases like those of more unusual position, the expected tenderness, skin hyperesthesia, reflex spasm or rigidity may not be so much in evidence and the gravity of the case is greater than the physical signs would indicate. It is in such cases more than others that the leukocyte count, fever, and pulse are of greatest import. I do not believe

the importance of a rectal or bimanual examination can be overestimated. Especially in the deeper situated positions, the examining finger may come closer to the affected organ by rectum than through the abdominal wall, and a greater stimulus therefore applied to the affected organ will bring it in contact with a more sensitive peritoneum. An exception to this would be a highly situated vermiform process which the finger cannot reach upon rectal examination.

Summary and Conclusions

1. Two nerve supplies are involved in acute appendicitis, the viscus innervation being from the visceral afferent fibers of the splanchnic nerves of the sympathic nervous system and the peritoneal from the somatic nerves.

2. The stimulation of the visceral afferent nerves is due to distention of the appendix and clinically causes a diffuse, boring type of pain without definite localization, without elevation of temperature, hyperesthesia, spasm or rigidity.

3. The somatic nerves respond to inflammation and localize the disease. With localization of pain we find the elevation of fever, leukocytosis, spasm, rigidity and hyperalgesia.

4. If the appendix is not in contact with normal peritoneum, the localizing pain may not exist.

5. Leukocytosis, fever and probably rectal examination may be of great aid in making a diagnosis in these latter cases.

References

Hurst, A. F.: The Sensibility of the Alimentary Canal, London: Frowde, 1911.

Morley, J.: Abdominal Pain. Edinburgh: Livingstone, 1931.

Poulton, E. P.: Oliver-Sharpey lectures on experimental study of certain visceral sensations. Lancet, 2:1223-1230, (Dec. 15) 1928.

Sheehan, D.: Afferent nerve supply of mesentery and its significance in causation of abdominal pain. Jour. Anat., 67:233-249 (Jan.) 1933.

Wangensteen, O. H., Buirge, Raymond E., Dennis, Clarence and Ritchie, Wallace P.: Studies in the etiology of acute appendicitis. Ann. Surg., 106:5, (Nov.) 1937.

THE AMERICAN FERMENT

Speaking at a dinner in honor of Dr. J. Stanley Kenney, president of New York County Medical Society, on May 19, Dr. Nathan Van Etten, past-president of the AMA, said, in part:

"The great melting pot of civilization, which is the United States of America, has often been overheated during the years of Dr. Kenney's experience.

"Modern medicine and the revelations of science have upset empiric traditions, so that he is now engaged in studying new therapies—new methods for restoring the sick to functional usefulness and new ideas to enlist community support in the prevention of disease.

"New social forces have risen to disturb medical evolution by violent explosions which are impatient of normal adjustment. Elements unfriendly to the medical profession have been in power for ten years, upsetting the peaceful progress of a great nation by erecting powerful bureaus, which rule by fascist decree; which do not serve the people, but who command the people to serve them.

"Although the medical profession has voluntarily enlisted fifty thousand of its young doctors in the service of the war emergency, it is reviled for lack of support of the whims of idealists who claim to be interested in new distributions of medical service.

"Mr. McNutt shakes his fist at the physicians of the country in June at Atlantic City, Frances Perkins calls them obstructionists on January 20, and Mrs. Roosevelt gnashes her teeth and tells doctors on the third of May that if they do not voluntarily conform to the wishes of autocracy that they will be compelled to do so.

"No longer are our elected representatives, whose wages are paid by the taxpayer—no longer are they our servants, but they are our masters. No longer does the State serve us, but we slavishly serve the State.

"Let us not forget that this unfortunate situation is the result of fermentation by agitators who have long been working at every social level, and that widening cracks are appearing in the surface and in the foundations of our economic, religious, and social systems which may engulf us.

"Civilization is sick! It needs good doctors. Shall we be equal to the task of doing our part toward preventing complete destruction of what we have been proud to call American Democracy?

"The answer to this question is yes if we shall wake up and work."—*N. Y. State Jour. Med.*, June 15, 1943.

CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL

A. J. Hertzog, M.D., and S. V. Lofsness, M.D.
Pathologists

Presentation of a Case

A-43-933

Dr. Arthur: The case is that of a forty-one-year-old man who was admitted to the Nervous and Mental Service of the Minneapolis General Hospital on April 13, 1943, where he died on May 19, 1943.

He was first admitted to this hospital on January 10, 1943, shortly after an automobile accident. He was unconscious on admission but recovered consciousness in a few minutes. He was lethargic and complained of a severe headache. There was no evidence of a head injury and it was thought that the accident was the result of a spontaneous cerebral accident. The patient stated that he had had hypertension for several years, and that two years previously he had had a stroke. This caused a left hemiplegia which improved over a period of several weeks, but at the time of the accident he still had some weakness of the left arm and leg.

Examination revealed his blood pressure to be 220/160, temperature 99.4, pulse rate 100. The heart seemed to be moderately enlarged and a soft systolic murmur was heard over the apex. His lungs were clear and there were no masses in the abdomen. Neurological examination showed slightly hyperactive reflexes in both arms; the abdominal reflexes were absent; the cremasteric reflexes were normal; the cranial nerves were normal; the reflexes in both legs were slightly hyperactive and this was more marked on the left; the great toe signs (Babinski, Oppenheim and Chaddock) were negative on the right but positive on the left. There were no sensory abnormalities. The optic fundi showed hemorrhages and severe hypertensive changes in the vessels. X-rays of the skull were negative.

Laboratory studies: Urinalysis showed two plus albumin and two plus red blood cells; the spinal fluid was slightly cloudy and contained 55 mg. per cent protein, two leukocytes and 4,000 erythrocytes per cubic millimeter, and 80 mg. per cent sugar. Blood urea nitrogen was 94.5 mg. per cent. For several days he complained of headache, stiffness of the neck, and backache, but this gradually subsided. His left leg became moderately spastic and he developed left foot-drop. He was discharged on March 10, 1943, two months after admission, with a diagnosis of hypertension with cerebral hemorrhage and renal insufficiency. At home he remained in bed most of the time, and had little improvement in his left hemiplegia.

On April 13, 1943, he suddenly lost consciousness and had several generalized convulsions. He was admitted to the hospital in an unconscious state. He continued to have repeated convulsions for an hour, until they were controlled by phlebotomy and intravenous magnesium sulfate. The convulsions were generalized but seemed to originate in the left arm and leg. His temperature was 101.2, pulse rate 110, blood pressure 240/150. His heart again seemed moderately enlarged, had regular rhythm, and no murmurs were heard. His lungs were clear and no abdominal masses were palpated. Neurological examination revealed mystagmus to the left, and left homonomous hemianopsia. There was weakness and moderate atrophy of the left arm and leg, and the left foot was plantar-flexed and internally rotated. Reflexes were slightly hyperactive in the right arm and leg, and moderately hyperactive in the left arm and leg. The great toe signs were positive bilaterally. There was weakness of the lower half of the left side of the face.

Laboratory studies: The hemoglobin was 49 per cent (Sahli); his white blood count was 11,250 with 83 per cent neutrophiles, 15 per cent lymphocytes and 2 per cent monocytes; urinalysis showed two plus albumin and one plus red blood cells, and the specific gravity was 1.012; Blood urea nitrogen was 91 mg. per cent; creatinine was 6.8 mg. per cent; electrocardiogram showed left axis deviation but was essentially negative; Kline and Rytz were negative; spinal fluid was clear, with no cells and normal pressure.

His temperature remained normal for the next three weeks. He was lethargic and confused, and frequently had muscular twitching in his extremities. On May 8, 1943, his temperature rose to 101.8 degrees, and it remained elevated until his death. Spinal fluid taken May 8, 1943, was cloudy and contained 103 mg. per cent protein; there were 8,800 red cells and 620 leukocytes per cubic millimeter, with 77 per cent neutrophiles. He became unconscious, and remained so until his death. During the last three days he had several generalized convulsions. Several spinal taps showed slight to moderate increase in pressure. Moderately choked discs developed. Several urinalyses showed one to four plus albumin, a few red cells, and the specific gravity ranged from 1.010 to 1.013.

Dr. Hertzog: Here is a forty-one-year-old man with severe hypertension. Blood pressure readings were in the neighborhood of 220/160 and 240/150. We know that about 15 per cent of patients having primary hypertension die from cerebral hemorrhages or thrombosis

with infarction of the brain. About 10 per cent die from uremia due to the vascular damage to the kidneys. The remainder and greater majority die from congestive heart failure and coronary sclerosis. When no cardiac failure is present the heart shows only left ventricular hypertrophy. Hypertension predisposes to coronary sclerosis. This man had both the findings of uremia and a cerebral accident. Dr. Arthur will give the autopsy findings.

Dr. Arthur: The body was well nourished and there was no edema or jaundice. The heart weighed 540 grams, and showed hypertrophy of the left ventricle. The valves were normal, and there was only minimal coronary sclerosis. The right lung weighed 800 grams, the left 420 grams. On section, the lungs showed congestion and patchy pneumonia, especially in the right lower lobe. There were 1,000 c.c. of blood-tinged cloudy fluid in the right pleural cavity, and 300 c.c. in the left. The liver and spleen were of normal size and appearance. The gastro-intestinal tract, pancreas and adrenals appeared normal. The kidneys revealed an unsuspected lesion—polycystic disease. The right kidney weighed 820 grams, the left 1,240 grams. Both contained hundreds of cysts up to 2 cm. in diameter, with only narrow bridges of renal tissue between the cysts. The cysts contained clear fluid. The pelves, ureters, bladder and prostate gland appeared normal. The brain showed slight flattening of the convolutions and the pia-arachnoid was slightly cloudy. The large arteries at the base of the brain showed only slight sclerosis. On sectioning, a slightly fibrous yellow area of infarction was found in the right parietal lobe. It extended from the lateral ventricle to the cortex, and measured 7x3x2 cm. There was a fresh hemorrhage 2 cm. in maximum diameter in the left lenticular nucleus. There was also an old shrunken infarct 3 cm. in maximum diameter in the inferior portion of the right lobe of the cerebellum.

Dr. Lofsness: The polycystic kidneys were an unexpected finding in this case. Microscopically, sections of the kidney show the grossly visible cysts. Between them, the renal parenchyma shows numerous hyaline glomeruli associated with tubular atrophy and a mild lymphocytic infiltration. Some of the glomeruli are still open and are associated with dilated tubules, many of which contain casts. These functioning glomeruli are not overly cellular and do not suggest glomerulonephritis. There is marked hyaline arteriolsclerosis, and a few arterioles are thrombosed and associated with infarcted glomeruli. Some of the small arteries show collagenous intimal thickening, with marked narrowing of their lumina. This is the pattern of hypertensive kidney disease, and we feel that this patient has two distinct kidney lesions—polycystic disease and arteriolosclerosis. This section from the infarct in the right parietal region shows an area of necrosis partially replaced by glial proliferation in which there are numerous macrophages filled with fat and others containing hemosiderin. This is probably the lesion which caused his left hemiplegia two years ago, and it was probably increased in size at the time of his automobile accident in January, 1943. The numerous macrophages containing old blood pigment suggest it is due to hemorrhage and not thrombosis. A section through the left lenticular nucleus shows fresh hemorrhage, with no cellular reaction. A section from the lower lobe of the right lung shows pneumonia. The liver shows only a few microscopic cysts in the portal spaces, indicating minimal cystic disease of the liver. No cysts were seen grossly. Sometimes cystic disease of the liver and pancreas accompanies polycystic kidney disease, and occasionally is marked enough to dominate the picture.

Congenital polycystic disease of the kidney is relatively rare. Bell found clinical bilateral polycystic kidneys once in every 600 autopsies. The frequency in different statistics varies with the proportion of subclinical and hypoplastic cases that are included. About 30 per cent of the cases die in infancy or are stillborn. There are few deaths during the second and third decades but many die in the fourth and fifth decades. Most of them have hypertension and renal insufficiency and unless the enlarged kidneys are palpated, a clinical diagnosis of chronic glomerulonephritis usually is made. The blood pressure is seldom as high as in this case. In view of the microscopic changes in the kidneys, we feel that in addition he had essential hypertention. The cause of death was uremia, cerebral hemorrhages, and terminal bronchopneumonia.

Anatomic Diagnosis: (1) Essential hypertension with uremia; (2) congenital polycystic kidneys; (3) multiple cerebral hemorrhages; (4) hypertrophy of heart; (5) bronchopneumonia.

CHINESE BLOOD BANK

A Chinese blood bank, opened June 7 at 154 Nassau Street, New York City, to seek blood donations for soldiers of the Chinese armies, will accept the blood of persons who have had malaria, according to its sponsor, the American Bureau for Medical Aid to China. This can be done by using the Seitz filter, which eliminates malaria micro-organisms.

Almost every Chinese has had malaria at some time in his life, and the sponsors of the project realized that there could be few Chinese donors to the blood bank if persons who had suffered from the disease were ruled out. Dr. John Scudder of Presbyterian Hospital, who as Chairman of the Blood Bank Committee of ABMAC, has been largely responsible for carrying through the project, had tested and proved the efficacy of the filter in Puerto Rico.

Blood donations received at the bank are converted in its own laboratories into dry plasma and shipped to China in American army planes. The medical staff members of the blood bank, all of whom are Chinese, have had special training in American hospitals for this work and eventually will go to China as a unit to set up the first blood bank there.

CONGENITAL ARTERIOVENOUS ANEURYSM

RAMONA L. TODD, Ph.D., M.D.

Minneapolis, Minnesota

THE following case of congenital arteriovenous aneurysm is of interest because of its rarity, and some of the findings are worthy of note. Pemberton and Saint[8] reported a series of nine congenital arteriovenous communications seen at the Mayo Clinic from 1916 to 1928. Lewis,[7] in 1930, collected twenty-four cases from the literature and added six of his own. Horton[6] observed twenty-four cases at the Mayo Clinic from 1929 to 1931. Reid and McGuire,[9] in 1940, reported thirty instances of aneurysm which included five congenital arteriovenous communications. Aside from these series several writers have reported one or two cases, but the total number in the literature is not great.

William Hunter is credited with the first accurate description of arteriovenous aneurysm[4] and in his report in 1757 he noted the presence of a continuous murmur over the site of the communication. Branham,[1] 1890, found that pressure over a large acquired fistula causes a slowing of the pulse rate, and this phenomenon is generally known as Branham's sign, although it was demonstrated by other observers as early as 1875. Branham's sign, according to Holman,[6] is the first evidence that the circulatory bed through which the short-circuited blood flows is beginning to dilate.

Report of Case

C. W. S., aged nineteen, was first seen in the Students' Health Service dispensary on August 6, 1942. His complaints were swelling and aching pain of the right hand and lower forearm when the arm was dependent, weakness of right arm and hand, tenderness of the skin of the right hand, nosebleeds, episodes of dizziness and "pounding" in the head during the previous year. Symptoms referable to the right upper extremity had been present since birth but had been more marked during the past year. He had never consulted a physician because of those symptoms, but his mother had noticed the abnormality of the right arm when the patient was an infant.

He had had no other serious illnesses in his lifetime. He had had no operations except tonsillectomy and no accidental injuries. So far as could be determined, birth had been normal. Family history revealed no significant physical defects among relatives.

The patient was 71 inches tall and weighed 190 pounds. Examination showed the head and neck, heart and lungs, abdomen and lower extremities to be normal. The distal phalanges of the right hand were markedly clubbed and the nails were of watch-crystal shape. The nail beds were markedly cyanotic. The left hand appeared to be entirely normal. The skin of the right hand and arm was pale, whereas that of the left arm was pink. The right hand and arm felt much warmer to the touch than the left, a fact which the patient had noted subjectively. The superficial veins in the right hand and forearm were enlarged and tortuous (Fig. 1),



Fig. 1. The appearance of the dorsum of the right hand with its dilated veins as compared to the normal left hand. Infra-red photograph.

Fig. 2. Infra-red photograph of the right arm showing the dilated superficial veins.

and a mass of dilated veins extending to about nine centimeters above the elbow was apparent on the ventral surface of the arm (Fig. 2). There was a mass of dilated veins measuring five centimeters in diameter just posterior to the right axilla.

A "six-foot" roentgenogram revealed a normal heart and the electrocardiogram showed normal findings. Roentgenograms of the right shoulder, both hands, thoracic and cervical vertebræ revealed no osseous abnormalities. The measurements of the two upper extremeties are recorded in Table I. There was little difference in the sizes of the two arms when both were held upward. On being held in the dependent position for

From the Students' Health Service, University of Minnesota.

two minutes, the right hand increased 1.5 centimeters in circumference just proximal to the metacarpophalangeal joints.

The radial pulse was 88 at each wrist, and was rapidly rising and rapidly falling in character. Strength of pulsation was greater in the left radial artery than in the right. A thrill was felt over the veins above the right elbow and a faint, soft, continuous murmur with maximum intensity at the proximal edge of the dilated vessels was heard. Digital pressure over this point caused first a slowing and then cessation of the right radial pulse. There was also a slowing of the left radial pulse. The apical heart rate was speeded for one minute, then slowed to 56 during the application of pressure over the dilated veins and a continuous murmur was heard over the precordium with maximum intensity at the apex. Pressure over the same area on the left arm produced no changes in auscultation findings in the heart except to speed the rate from 88 to 96 beats a minute. The blood pressure cuff was placed on the right arm with the bag covering the group of dilated veins on the ventral surface. Inflation of the cuff to 30-40 mm. Hg. caused the radial pulse to drop from 88 to 60. Further increase in pressure (40-50 mm. Hg.) resulted in cessation of radial pulse in the right wrist. This procedure was repeated several times with the patient in the supine position, then in the sitting position, with the same results.

Arterial blood pressure (sitting position) was 162/94 in the left arm and 166/96 in the right arm. On another occasion it was 180/80 in the left arm. After the patient lay in the supine position for twenty minutes, he was found to have a blood pressure (left arm) of 160/94. Pressure over the mass of dilated veins increased the pressure to 170/104. With the patient in the sitting position the blood pressure was 166/96. Pressure over the mass of veins increased the pressure to 174/110.

Cold pressor tests were done on August 11, 1942. The standard procedure was followed.[2,3] "Basal" blood pressure was determined by having the patient lie in the supine position for thirty minutes. Temperature of the water was kept at 4° C. Findings are shown in Table II.

Venous pressure in the median basilic vein of the left arm was 14 centimeters of water and in the right arm 15.5 centimeters. Arterial pulsations were evident when the needle was in the vein in the right arm; the range noted was 12 to 18.5 centimeters of water. Blood urea nitrogen was 11 mg. per cent and urinalysis was normal.

A diagnosis of congenital arteriovenous aneurysm with numerous small communications was made.* After consideration of the possibility of encountering many small passages and difficulty of dissection, it was decided to defer treatment until such time when cardiac damage makes surgical procedure imperative and justifies the probable amputation of the right upper extremity if attempt at repair is not successful. The difficulty in treatment of congenital arteriovenous aneurysms lies in the fact that the abnormal communications between arteries and veins are usually multiple,[6] and there is ample indication that this is true in this case.

The barely audible bruit in the case herewith presented is interpreted as resulting from the presence of at least one communication of sufficient size to cause a murmur.

TABLE I. COMPARISON OF SIZE OF ARM WITH ARTERIOVENOUS ANEURYSM TO OTHER ARM*

Upper Extremity	Circumference			Length
	Palm	Mid-forearm	Mid-arm	
Right	22 cm.	26.5 cm.	28.5 cm.	85.0 cm.
Left (Normal)	22 cm.	25.5 cm.	29.0 cm.	84.5 cm.

*All readings were taken at measured distances from a fixed point in order to secure comparable data. Length was taken from acromial process to tip of middle finger.

TABLE II. COLD PRESSOR TEST

		"Basal" Pressure	Hand in Water 30 Seconds	Hand in Water 60 Seconds	Time to Return to Basal Level
Right hand in water; cuff on left arm	Syst.	160	160	164	5 minutes
	Dias.	94	100	104	
Left hand in water; cuff on right arm	Syst.	160	170	170	15 minutes
	Dias.	94	120	120	

Bibliography

1. Branham, Harris H.: Aneurismal varix of the femoral artery and vein following a gunshot wound. Internat. Jour. Surg., 3:250, (Nov.) 1890.
2. Hines, E. A., Jr.: Technique of the cold pressor test. Proc. Staff Meet., Mayo Clin., 14:185-187, (March 22), 1939.
3. Hines, E. A., Jr., and Brown, G. E.: A standard stimulus for measuring vasomotor reactions: its application in the study of hypertension. Proc. Staff Meet., Mayo Clin., 7:332-335, (June 8) 1932.
4. Holman, Emile: Arteriovenous Aneurysm. New York: The Macmillan Company, 1937.
5. Holman, Emile: Clinical and experimental observations on arteriovenous fistulæ. Ann. Surg., 112:840-875, (Nov.) 1940.
6. Horton, Bayard T.: Hemihypertrophy of extremities associated with congenital arteriovenous fistula. Jour. A.M.A., 98:373-377, (Jan. 30) 1932.
7. Lewis, Dean: Congenital arteriovenous fistulæ. Lancet, 2:621, (Sept. 20); 680, (Sept. 27) 1930.
8. Pemberton, J. deJ., and Saint, J. H.: Congenital arteriovenous communications. Surg., Gynec. and Obst., 46:470-483, (April) 1928.
9. Reid, Mont R., and McGuire, J.: Arteriovenous aneurysms. Ann. Surg., 108:643-693, (October) 1938.

*Confirmed by consultation with Dr. B. T. Horton, Rochester, Minnesota.

HISTORY OF MEDICINE IN DODGE COUNTY

BY JAMES ECKMAN
Rochester, Minnesota

and

CHARLES E. BIGELOW, M.D.
Dodge Center, Minnesota

(Continued from June issue)

Another itinerant physician, not known to be a quack, however, was a **Dr. J. V. Frost,** who came to Concord in January of 1884. He made extravagant promises as to his ability to cure chronic diseases, but soon left Concord for lack of patronage. A brief commentary on Doctor Frost's experiences in the village of Kasson in January of 1884 was provided by the *Dodge County Republican* of that village. In its issue for January 17, 1884, the newspaper observed:

> Doctor Frost visited this town on Monday in the capacity of a lecturer. On Monday evening, after a very interesting lecture on physiognomy, he exhibited the wonderful mysteries of messmerism [*sic*]. On Tuesday night, he lectured on marriage, at the close of which he tried but failed to find a messmeric subject.

In its issue of one week later (January 24, 1884) this newspaper commented grimly:

> Dr. J. V. Frost, who lectured in this village on Monday and Tuesday evenings of last week, left on Wednesday without paying his hall rent. The fact is he had no money to pay with, and pursued the only course left for him in his estimation. The Doctor is behind the times many years and cannot succeed until he reaches the front of science as now taught. He represents a system that has long gone out of use and no longer attracts.

Some of the patent remedies advertised in the *Dodge County Republican* itself, however, probably were no more efficacious than the therapeutic methods of Doctor Frost. In the first part of 1885 some of the compounds offered for sale through the columns of this newspaper were Doctor Guysott's Yellow Dock and Sarsaparilla, Bucklen's Arnica Salve and Taylor's Cherokee Remedy of Sweet Gum and Mullein.

An institution in the East which repeatedly advertised in this newspaper was the "World's Dispensary Medical Association," of 663 Main Street, Buffalo, New York, which operated the "Invalid's Hotel and Surgical Institute—Not a Hospital, but a pleasant Remedial Home, organized with A FULL STAFF OF EIGHTEEN PHYSICIANS AND SURGEONS and exclusively devoted to the treatment of all Chronic Diseases." Closer to Minnesota was "Dr. McNamara's Medical Rooms, Established 1861, for the radical cure of Nervous and Sexual Diseases, 580 Broadway, Milwaukee."

Reproduced in the columns of the *Dodge County Republican* at various times were reports of the status of the public health in Kasson, such as the one which follows, taken from the issue of April 23, 1885.

BOARD OF HEALTH

At a regular meeting of the Kasson Board of Health held in the office of Geo. B. Arnold, on Monday evening, April 21st, the following resolutions were unanimously adopted:

RESOLVED, That lot-owners are required to abate all nuisances on their respective lots; all cellars, privy vaults and piles of garbage be disinfected and purified by the 15th of May, in accordance with ordinance No. 46, of the village of Kasson.

RESOLVED, that notice be given to lot-owners of our action, by publishing these resolutions in the Dodge County Republican.

RESOLVED, That our regular monthly meetings be held on the last Tuesday of each month.

H. T. TURNER, President.

J. G. WHEELER, Secretary.

From about 1884 to 1886, it would appear, **Dr. Charles Hill** (1826-1914) of Pine Island was health officer of Milton Township in Dodge County.[128] He reported to the Minnesota State Board of Health and Vital Statistics that from August 1, 1884, to December 1, 1886, he had noted two instances of scarlatina, in one of which the patient had died. **Dr. Osmon F. Way** (1858-1936), who during the same period was health officer of Claremont, reported[128] that three patients had fallen victim to diphtheria in Claremont, and that all three patients had died of the disease.

At some time after 1882 (probably in 1885) **Dr. Charles W. Coleman** (1855-1925), who had been reared in Dodge County, settled at Hayfield to practice medicine. The university examiner and registrar of the State University of Iowa[129] has reported that Doctor Coleman was a student in the Department of Homeopathic Medicine of that institution in 1882, but that he was not graduated as a Doctor of Medicine. He was licensed to practice medicine in Minnesota by affidavit in 1887, but a record of his medical education was not obtained at the time.[40] The first physician in Hayfield, Doctor Coleman left the town in 1894, and it is believed that thereafter he did not practice medicine.

Dr. John C. McMartin (1863-1890), who had been born in Ripley Township in Dodge County, had a professional notice in the first issue of the *Dodge County Republican*[130] for 1885:

J. C. McMARTIN, M.D.
Physician and Surgeon
Dodge Center, Minn.
Office over Hunt's Drug Store

Doctor McMartin had studied medicine at the old Minnesota College Hospital in Minneapolis, but did not in 1885 have the degree of Doctor of Medicine, nor was he at the time licensed to practice medicine in Minnesota.[40] He went back to the Minnesota College Hospital in January of 1885, and in September of that year went to Louisville, Kentucky, to matriculate at the old Louisville Medical College.[131] He was graduated from this school in 1886.[132]

In October of 1885 **Dr. Charles W. Merrill** came to West Concord from Rock Elm, Wisconsin.[133] He had been graduated from the Cleveland Medical College of Western Reserve College in 1878, and was licensed to practice medicine in Minnesota on October 16, 1885.[40]

In April of 1886, as previously stated, Doctor Porter of Claremont traded his stock of drugs to Doctor Coleman of Hayfield for Kansas land,[124] and in May he left Claremont never to return, so far as is known. In October of

1886 he was living in DuBois, Nebraska.[134] The career of this interesting pioneer physician will be recounted later.

In March, also, Doctor McMartin, who now had his degree from the Louisville Medical College, located in Mantorville and saw his first patient there.[132] Two weeks later he removed to Dodge Center, and in May he moved to Kasson.

In May of 1886 Doctor Garver of Dodge Center, who was health officer of Wasioja Township (in which Dodge Center is included), reported[135] to the Minnesota State Board of Health and Vital Statistics that he had inspected various places in the township with these observations:

> Thorough inspection made. General condition fair. Pig-pens found too near wells ordered removed. Old-fashioned "holes in the ground" ordered cleaned out and above-ground receptacles substituted. Orders promptly obeyed and marked willingness to accept the suggestions of the board.

The slowly decaying hamlet of Wasioja received its last physician in September of 1886.[136] This was **Dr. Lewis Thomas Francis** (1855-1932) who had been graduated from the old Chicago Homœopathic Medical College in 1884. He had practiced in College Springs, Iowa, before he came to Wasioja, where he was to remain until 1902.

Dr. Elias Wells Kellogg (1859-1923), who had begun to study intermittently at the Rush Medical College in 1885, came to Dodge Center in February of 1887 to read medicine with **Dr. James A. Garver** (1814-1901), who at the time was seventy-three years old. Doctor Garver had taken a fancy to young Kellogg, who had come to Dodge County with a surveying crew for the old Minnesota and Northwestern Railway Company (now the Chicago and Great Western Railway Company). Young Kellogg studied with Doctor Garver and attended medical lectures at various times at the Rush Medical College of Chicago, from which he was graduated in 1889. He was never licensed to practice medicine in Minnesota.[40]

Dr. John C. McMartin left Kasson in May of 1887 to locate in Benson in Swift County.[137] He was already a victim of pulmonary tuberculosis, and within three years from this transfer to Swift County he was dead.

In May, also **Dr. Arthur L. Travis** (1861-1927) apparently decided that Dodge County was not to his liking, for he abandoned his office above the Central Store in Claremont in that month to go to Cottage Grove, Wisconsin, his native state.[138] He had opened an office in Claremont in April of 1887.[139]

It is believed that Dr. Charles W. Merrill left West Concord in the early part of 1887, for in May of that year **Dr. Elmer John Tiedemann** (1864-), a graduate of the Rush Medical College of Chicago in 1886, bought the team of horses that formerly had belonged to Doctor Merrill. Doctor Tiedemann remained in West Concord until 1890.

At some time in 1887 (possibly when Doctor Kellogg began to study medicine under Doctor Garver) **Dr. William H. Parker** (1859-1913), who had been in partnership with Doctor Garver at Dodge Center, left Dodge County. Where he went at this time is not known, but eventually he located at Earlville, Iowa.

It is believed that Doctor Kellogg himself left Dodge Center in 1888, possibly to continue his studies at the Rush Medical College of Chicago.

A physician of distinguished parentage came to Mantorville in November of 1888.[141] He was **Dr. Samuel H. Van Cleve** (1853-1912), son of a general of the War of the Rebellion and of a woman well known in the annals of

Minnesota, as will be shown. Doctor Van Cleve had been city physician of Minneapolis from 1885 to 1887, and it is believed that he came to Mantorville at the instance of **Dr. John Flood** (1850-1918), who was about to go to Chicago to continue his medical education. Doctor Van Cleve maintained Doctor Flood's practice for him while Doctor Flood was in Chicago, and when Doctor Flood returned in the spring of 1889, Doctor Van Cleve bought the Mantorville practice from him. Doctor Flood thereupon moved to Kasson.

For reasons not entirely clear to the authors the veteran eclectic physician, **Dr. Henry T. Turner** (1837-1913) of Kasson, moved to Walla Walla, Washington, late in 1888 or in the early part of 1889. Doctor Turner had been in Kasson since 1875, save for a short period in 1882 which he spent in Minneapolis. He died in Washington in 1913, as will be shown.

In June of 1889, so far as available evidence indicates, **Dr. Guy P. Corwin** (1855-1929), the first graduate of the University of Minnesota College of Medicine and Surgery to locate in Dodge County, settled for a short while in Wasioja, where he had been reared but not born. He had studied medicine with Doctor Flood at Mantorville, and had attended the old Minnesota Hospital College in Minneapolis, obtaining his degree in medicine from the University of Minnesota after examination, according to the procedure described by Beard.[90] Doctor Corwin did not stay long in Wasioja. In July of 1889 he took and failed to pass the examination for licensure conducted by the Minnesota State Board of Medical Examiners, and he never applied for re-examination.[40] By 1890 he was in Augusta, Wisconsin.

At some time in 1889 **Dr. James Mansfield Ryder** (1822-1900), who had come to Milton Township in 1855 primarily to farm, moved to Buffalo in Wright County.[142] Doctor Ryder may have practiced medicine prior to 1883, but he apparently did not practice it after that year, for he was never licensed to practice medicine in Minnesota.[40] He could easily have qualified for licensure by exemption under the law of 1883, had he wished to do so. He is not to be confused with Dr. Jacob Ryder (1843-1895) of Saint Paul.

The Arrival of Order, 1890-1900

By the year 1890 the practice of medicine in Dodge County had been established on a reasonably orderly basis. New men were coming to the county from good medical schools; it had become easier to regulate and even to prevent the activities of the itinerant quacks or occasional renegades who had plied their arts in the eighties, although it is nevertheless true that many of the older, poorly trained physicians (and in some cases physicians who had none but empiric experience in medicine) who had been legally empowered to practice medicine by the exemption clause of the law of 1883 were still in active practice. Some older physicians, like Doctor Garver of Dodge Center, were beginning to think of retiring from their more strenuous labors of previous years.

The days of the railroad builders ended in the eighties in Dodge County after the old Minnesota and Northwestern Railway Company constructed the last main lines in the county in 1885. Highways in the county, however, were still far from being comparable to the well-engineered, hard-surfaced thoroughfares of today. It was still as difficult for the physician of 1890 to reach many of his patients as it had been for the physician of 1860 or 1870. The advent of the telephone in some parts of the county meant only that the number of difficult and even hazardous journeys the physician had to make would be increased.* It was true in the nineties, as it is true today, that the welfare of

*One Dodge County physician, Dr. C. L. Chambers (1858-1904) of Kasson, actually was injured fatally on the roads of Dodge County, as will be shown herein.

the physician in an agricultural community varied according to the welfare of the community he lived in: he was paid for his professional services if money was available generally in his community; if it was not, he either waited for it or was not paid at all.

The influx of physicians into Dodge County in the nineties was greater than at any other time in the history of the region, even in the days when an abundance of free land could be had for the asking. Some of these physicians of the nineties stayed only a short while; others stayed to pursue successful careers and to become extremely valuable citizens. The county was not excessively far from Minneapolis and Saint Paul, where several good medical colleges were graduating well-equipped physicians annually; the territory which included Dodge County was pre-eminently rich in agricultural resources; and the towns within the county by this time had firm foundations, with recognized and appraisable channels of commercial activity which would attract the physician fully as much as the merchant, lawyer, banker or tradesman.

A physician who chose to leave a practice of thirty years in 1890 was **Dr. John Jacob Everhard** (1829-1908) of Kasson. He was a highly competent practitioner, well known throughout Southern Minnesota and in the state itself. At the solicitation of his wife's parents he left Kasson in April of 1890,[143] to go to Seneca, in Nemaha County, Kansas, only a few miles from Dr. Horace P. Porter (1839-1912) at DuBois, Nebraska. At the time, Dr. Everhard was sixty-one years old. So far as is known, he never returned to Dodge County, although he died in Minnesota.

Dr. Elmer John Tiedemann (1861-) of West Concord left that town in July of 1890, apparently because he did not care for the rigors of rural medical practice.[144] He removed to LaCrosse, Wisconsin, where he remained for some years. At present (1943) he is living in Adrian, Minnesota.

Shortly after Doctor Tiedemann left West Concord, a homeopathic physician settled in that town. He was **Dr. Cornelius V. Lynde** (1858-1926), and he came to West Concord from Faribault.[145] He stayed in West Concord for less than a year, going to Northfield in April of 1891.[146]

Dr. Everhard went to Kansas in the spring of 1890 because he was seeking a warmer climate than that of Minnesota, whereas in the fall of the same year **Dr. Charles Sumner Bigelow** (1845-1931) left Kansas to return to Dodge County. Kansas for about three years prior to 1890 had been devastated by exceptionally severe droughts. Dr. Bigelow returned to Dodge Center in October of 1890, and he remained there until 1912, save for a few months in 1898 and 1899 in which he had an office in Claremont.

Dr. John Flood (1850-1918) of Kasson left Dodge County in the spring of 1891, and by his going he brought a new physician to the county, **Dr. Charles Osborne Wright** (1864-). Dr. Wright, whose preceptor had been the veteran **Dr. William Thorne** (1820-1908) of Hastings, came from Hastings in Dakota County to buy Doctor Flood's practice at Kasson.[148] He had obtained his license to practice medicine in Minnesota only a few months previously, on April 10, 1891.[40]

While Doctor Wright was settling in Kasson, **Dr. Frank French Clifford** (1863-) of LeCenter, Minnesota, was visiting West Concord to determine whether or not he would locate there.[149] By June he was well established in the town,[150] and he remained there until October 1, 1941, when he moved to Rochester to live with a daughter. During his service of a half century to the people of West Concord he occupied several positions of trust and responsibility in the community.

Dr. Ranson of Dodge Center was accustomed to attend the sessions of the Minnesota State Medical Society. He did so in 1891, when the society held its twenty-third annual meeting in Minneapolis, and there he reported[151] to members of the organization his treatment of a patient in Waltham, Minnesota, who had intestinal obstruction. **Dr. Perry H. Millard** (1848-1897), at the time dean of the University of Minnesota College of Medicine and Surgery, assisted Dr. Ranson in this case.

Only one new physician came to Dodge County in 1892. He was **Dr. Carlos Lord Chambers** (1858-1904), and he had been reared in Mantorville, although he had not been born in Minnesota. He came from Canby, Minnesota to Kasson in January of 1892,[152] to open an office over William E. Porter's store in that town. Twelve years later he died in Minneapolis, after an operation performed for injuries he had sustained when he was thrown from his buggy while he was returning from a professional call in the country.

Soon after her graduation from the University of Minnesota College of Medicine and Surgery in 1893, **Dr. Louise Marie Gerber-Dietmeier** (1865-1936) came to West Concord. She was not a native of Dodge County, but she had been reared in the Swiss colony of Berne in Milton Township. Very shortly, however, she went to Ada, Minnesota, and by 1898 she was living in Jasper.

It has been stated that **Dr. Charles W. Coleman** (1855-1925) left the village of Hayfield in 1894 to live on his father's farm in Milton Township. In May of 1895 **Dr. Eric O. Giere** (1868-1942) moved from Madison, Minnesota, to Hayfield. He stayed in Hayfield less than two years, however, returning to Madison in January of 1897. He himself reported[153] that he came to Hayfield because of the proximity of that town to the Mayo Clinic in Rochester. Later in his career he organized at least three clinics of his own in Minnesota and South Dakota.

In the fall of 1895 **Dr. James McCrea** (1863-1939), a Canadian physician who had been graduated from the McGill University Faculty of Medicine in 1894, came to West Concord. He moved to Fulda, Minnesota, in March of 1896, and lived there until his death in 1939.[154]

Dr. Osmon F. Way of Claremont and Dr. Stephen W. Ranson of Dodge Center in March of 1896, it was recorded,[155] attended a primiparous patient seventeen years old for placenta prævia. The condition was interesting, and the case was reported in the *Transactions* of the Minnesota State Medical Society.[155]

In July of 1896 **Dr. William M. Edgerton** (1870-1939) rented an office in Claremont.[156] He had been graduated from the University of Minnesota College of Medicine and Surgery in 1896, and had received his license to practice medicine in Minnesota on June 9.[40] Like Doctor Van Cleve of Mantorville, Doctor Edgerton was of distinguished stock. His father, Alonzo Jay Edgerton (1827-1896), was a brevet brigadier general in the War of the Rebellion, and in 1881 was United States Senator from Minnesota. The elder Edgerton had come to Mantorville in 1855, but the son had been reared in the Territory of Dakota, to which his parents had moved when he was a boy. Doctor Edgerton stayed in Claremont until March of 1898, at which time he went to South Dakota.[157]

(To be continued in August issue)

References will appear at conclusion of article

President's Letter

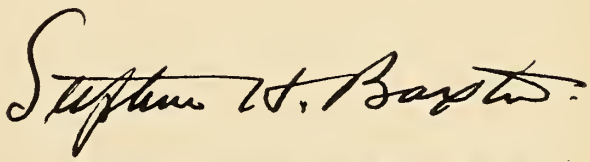
THE veil of mystery behind which the cause of puerperal fever was hidden a hundred years ago has, long since, been torn away and today, in Minnesota, this disease has almost disappeared from the category of causes of death. This thought is suggested by the 100th anniversary of the publication of one of the great papers of medical literature. In 1843 Oliver Wendell Holmes, then a young man of 34 years, published his paper on "The Contagiousness of Puerperal Fever." Other authors before him had published case reports and had arrived at the same conclusion, but it remained for Holmes to gather such an array of clinical reports and present them in such convincing fashion as to make an unanswerable argument. In spite, however, of the preponderance of evidence that he presented, his conclusions met with violent opposition from some of the foremost members of the medical profession, and, unfortunately, he did not "follow through."

It may be a source of regret that Holmes did not follow his clinical demonstration by thorough scientific study, and support his circumstantial evidence by scientific proof. However, the glory that American science lost was, possibly, offset by the gain to American letters, when Holmes turned to the field of literature.

A Hungarian, Semmelweiss, took up the crusade and in 1849 published his first paper on the etiology of puerperal fever. He strengthened the foundations on which the concept of the contagiousness of the disease rested and made definite suggestions for the protection of parturient women against it. His discoveries also met violent opposition from the Professors and he died insane, his sensitive nature unable to stand the strain of the battle against prejudice.

It remained for Pasteur, in 1879, to announce the discovery of the cause of the infectious diseases, including puerperal fever. He was of tougher fiber, and opposition stimulated him to greater effort. One quotation from his writings, gives an insight into his character "Do repeat to me every criticism you hear; I much prefer them to praise, barren unless encouragement is wanted, which is certainly not my case; I have a lasting provision of faith and fire."

Verily, we are One World, and no nation has a monopoly of prejudice, intolerance and wilful blindness. But the heartening, encouraging observation to be made on this 100th anniversary, is that in Science we are, in fact, One World, and scientific discoveries made by an American, a Hungarian and a Frenchman are used today, irrespective of their origin, for the benefit of all mankind. No amount of artillery can make valid the doctrine of inherent racial superiority or inferiority.



President, Minnesota State Medical Association

Editorial

Carl B. Drake, M.D., *Editor;* George Earl, M.D., Henry L. Ulrich, M.D., *Associate Editors*

THE NEW COUNCIL ON MEDICAL SERVICE AND PUBLIC RELATIONS

THE new Council on Medical Service and Public Relations, formed recently in Chicago by the House of Delegates of the American Medical Association, is the direct outcome of action initiated by the North Central Medical Conference in Saint Paul last Fall. It paves the way for a new and effective public policy for medicine in the United States and it is highly significant that the first steps looking to its creation met with spontaneous enthusiasm and support from all parts of the country. Clearly, many medical leaders everywhere were feeling the need of better public relations and more effective coöperation with public agencies, not only in the war emergency, but in planning for postwar adjustments ahead.

The original action taken in Saint Paul was carried to the National Conference on Medical Service of which W. L. Burnap, M.D., of Fergus Falls, Chairman of our Council, was then Secretary and is now President. A resolution embodying the plan in general terms was presented to the Board of Trustees of the American Medical Association from that Conference. This resolution pointed to the need for a new and more realistic handling of the public affairs of the Association and this action was subsequently developed and made specific by a Committee of the Conference for presentation to the House of Delegates.

The resolution prepared by that Committee was presented to the Minnesota House of Delegates and unanimously approved here and in many other states whose delegates met before the Chicago meeting. It called for a "Committee on Medical Service" and specified that one of the principal duties of the Committee should be to establish a headquarters for information and advice to government agencies and to medical bodies, in Washington, D. C. Specific provisions were made for election of the nine members of the Committee and for the source of income and the character of personnel to be hired. The resolution was presented to the House of Delegates in Chicago by W. A. Coventry of Duluth, one of the delegates from Minnesota.

It is interesting to note that no less than eight other resolutions, all having a similar objective, were presented in Chicago. One of these, involving possible changes in the Constitution and By-Laws, was referred to the Reference Committee on Constitution and By-Laws. The others were referred to the Reference Committee on Medical Legislation and Public Relations and an unprecedented number of persons, totalling more than 150, crowded into the Committee rooms to be heard on the matter.

Both Reference Committees accepted the resolutions in principle. The Reference Committee on Medical Legislation and Public Relations recommended that a Committee on Medical Services be set up to be made up of six rather than nine members, as suggested in the National Conference resolution, but that the six should be selected on a basis of geographical representation and that the Board of Trustees should be instructed to provide facilities and personnel. The Reference Committee on Constitution and By-Laws recommended, in accordance with the proposal in the other resolution, that an autonomous Council, on a par with the other Councils of the Association, be established for the same purposes and also for the purpose of supervising new plans for delivery of medical service and all other matters relating to postwar adjustments. Both of these reports were accepted by the House of Delegates and submitted to the Board of Trustees with the request that the Board report back to the House on the matter within twenty-four hours.

A recommendation to consolidate the two reports was made by the Board of Trustees the next day. The Board proposed in its report

that the new agency should be a Council of six members on the same basis as other Councils of the Association, and that it should be called the Council on Medical Services and Public Relations.

The report of the Board of Trustees was accepted without a dissenting vote though some formidable opposition had developed from a few Southern delegates in the Committee hearings and in the first reports to the House of Delegates.

The Board of Trustees, meeting on the day following adjournment, duly appointed the members of the new Council. Among the appointtees was A. W. Adson of Rochester, Minnesota, who presented the matter to the National Conference on Medical Service in February and who spoke on the resolution on the floor of the House of Delegates. Besides Dr. Adson the members are: J. H. Fitzgibbon, Portland, Oregon; J. R. McVay, Kansas City, Missouri; J. P. Leathers, Nashville, Tennessee; E. J. McCormick, Toledo, Ohio; Louis Bauer, Hempstead, New York; Roger I. Lee, Boston, Chairman of the Board of Trustees, James E. Paullin, Atlanta, Georgia, President, and Brig. Gen. Fred W. Rankin, Lexington, Kentucky, Past President of the American Medical Association.

Obviously it now rests with the new Council how far and how effectively the new program will be carried forward. But the groundwork has been laid and the overwhelming sentiment of the delegates for a new public policy has been expressed. Minnesota physicians who had much to do with initiating the move will watch with interest the progress of the new agency.

COMPENSATION FOR OCCUPATIONAL DISEASES

TWO years ago, at the recommendation of the Governor, an interim committee of the legislature was appointed to investigate the advisability of the addition of other occupational diseases besides silicosis and asbestosis for compensation under the Workmen's Compensation Law. This committee, after considerable study and consultation, prepared a bill so providing which was passed by the last legislature.

The danger of injustice to the employer or employe in such a bill, if the determination of the relation of a disease causing disability or death to occupation were left to any one but medical men, was realized. Provision was therefore made that all cases which involve only the question of an occupational disease shall be decided by a medical board of three physicians. A panel of ten physicians with at least five years of medical experience with industrial disease and five x-ray specialists with the same period of professional experience is to be appointed by the Dean of the Medical School of the University, the Council of the State Medical Association, and the Governor. The petitioner and employer may each choose one name from the panel, and these two shall choose the third member. The decision of the committee of three physicians shall be final.

The bill was well composed and seems to have provided against many possible abuses and should provide proper compensation for disability or death resulting from strictly occupational diseases. The bill received the approval of the Council of the State Medical Association. It should be effective if enough physicians and x-ray specialists are still available in view of the number away in service.

The bill includes among other provisions for compulsory autopsies in disputed cases, the strict limitation under occupational diseases to those "arising out of and in the course of employment peculiar to the occupation . . . and due to causes in excess of the hazards ordinary of employment".

No compensation is provided for occupational disease unless it has been contracted within twelve months previous to the date of disablement except in silicosis or asbestosis, in which case the disease must have been contracted within three years of disablement. Also, only occupational diseases contracted since the law went into effect are compensable. Those suffering from silicosis or asbestosis must have been exposed to the dust five of the past ten years and at least three years in the state to qualify.

At hearings involving controversial medical questions, the petitioner and employer may each provide the testimony of one physician. If the

applicant is refused, that is the end of the matter except that the usual appeal may be made. If, on the other hand, "such finding and conclusion are in favor of the petitioner or if no question other than that of occupational disease is presented by the pleadings, the commission . . . shall forthwith appoint a medical board of three doctors of medicine selected from a panel of fifteen . . ."

The new law also allows the employer to provide for examination of new employes and for yearly examination of employes in hazardous occupations, the expense to be shared by employer and employe.

One of the most important provisions of the new law is that the commission keep records of employment and regularly inspects places of employment in which hazards of an occupational disease may exist. It shall also establish standards of working conditions after consulting with the Division of Industrial Diseases of the State Department of Health.

The justice of compensation to workmen for accidents in the form of bodily injury has been recognized for some time. The term "accident" has been extended to provide compensation for disability or death due to diseases strictly resulting from occupation. While there may be room for some difference of opinion in individual cases, a committee of three medical men should be able to decide.

ACCIDENTAL DROWNINGS

JULY is the month when death from drowning reaches its peak. During this month the fisherman and bather are out on the water or in it more than at any other time, although all the months from spring to fall have their quota of fatality from drowning.

We read* that about 4,600 men of the U. S. Merchant Marine have been reported missing, presumably most of them through drowning, in the nineteen months prior to May 1, 1943. This is a high figure. When we also read that about twice that number of civilians in the United States met death from drowning during this same period, it is difficult to believe. Something should be done about it.

While occasionally it is the expert swimmer who overconfidently takes chances which the novice would avoid and perishes from drowning, shock, cramp or unknown cause, most drownings are due to lack of the ability to swim. Those who are unable to swim have no business in canoes, row boats and sail boats. Even the most expert swimmer finds it a difficult task to rescue even a child who is unable to care for himself and who becomes panicky when suddenly thrown into the water.

Learning to swim should be universal if this needless mortality is to be prevented. All power to propaganda directed toward this goal. Most important, too, is general knowledge of the technique of artificial respiration; the instruction widely disseminated by the Red Cross first aid classes is worth much. Of more importance, however, is providing supervised opportunities at beaches and swimming pools for both children and adults so they may learn to swim.

*Statistical Bulletin, Metropolitan Life Insurance Company, 24:9, (May) 1943.

NEW YORK PHYSICIANS MEET QUOTA

In an editorial which appeared in our June issue, we wondered what the explanation was for the apparent backwardness in the enlistment of physicians in Massachusetts, Connecticut and New York. An editorial in the June 15 number of the *New York State Journal of Medicine* declares that any statements that New York State has been behind in meeting its 1942 quota have been in error. On February 1, 1943, New York State had 9,000 physicians in service. Its quota for 1942 was 8,600. Since February 1, 1943, some 800 to 900 more have joined to meet New York's 1943 quota of 2,100. We are very happy to correct the uncomplimentary report which was repeated in our columns.

FIGHTING BLOOD CLOTS

A new way of using heparin, the anti-blood-clotting chemical, which may have life-saving usefulness in war surgery as well as in preventing thrombosis and embolism after operations, was reported by Dr. Leo Loewe and Dr. Philip Rosenblatt, of New York.

These doctors have found a way to deposit the heparin under the skin in what might be called banks of the anti-clot chemical. As a result it gets into the blood in a slow, even way, without dangerous runs or bankruptcies. The use of safe anti-blood-clotting treatment over protracted periods is thus made possible and practicable.—*Science News Letter*, June 12, 1943.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

RAILROAD BROTHERHOOD ENDORSES ASSOCIATION POLICY

The fight conducted by the Minnesota State Medical Association in the last legislative session against the appointment of Mr. N. H. Debel to the Industrial Commission had many public repercussions, most of them good.

None was more gratifying than the support and wholehearted approval of organized labor.

Working men and their associations have reason to value the right for which the physicians were fighting. They have felt the edge of Industrial Commission denial of those rights and appreciate keenly the soundness of the principle of free choice of physician which the medical association has always championed.

Doctors Applauded

The following memorandum on the 1943 session of the Legislature was prepared by Mr. Gottfrid Lindsten for the Brotherhood of Railroad Trainmen and distributed to all members, recently, as part of a legislative memorandum to members of the brotherhood. It is interesting not only because it applauds the stand of the Association on the issue of free choice, but because it takes note of the efforts of the Association, through its Committee on Public Policy, to maintain a high standard of service at state institutions for the mentally ill and the handicapped.

Undersigned entirely agrees with the following resolution adopted by the Minnesota State Medical Association through its House of Delegates in their 85th Annual Meeting at Duluth, Minnesota, in 1938, in which the Association set forth its position as in favor of the patient having the right to be attended by a physician of his own choice. Resolution follows:

Be it Resolved that the Minnesota State Medical Association declare itself in thorough accord and support of the principle that, in the interest of good public policy, the patient shall be permitted to choose his own physician, in cases involving liability and compensation insurance, as well as in private practice.

Undersigned unreservedly concurs in the position of the Association that such principle is fundamental and a right which should be enjoyed by every American citizen. The Legislature had by previous enactment of law laudably guarded such right, even to the extent of according it to a recipient of relief. The Supreme Court of Minnesota has interpreted the law to the end that an injured workman has the right to be attended by a physician of his own choice.

The Supreme Court of Minnesota in 1922, in the case of Lading vs. City of Duluth, held that an injured workman has "the option or unquestioned right to choose his medical attendant * * *." Again in 1940, in the case of Carmody vs. the City of Saint Paul, the Supreme Court of Minnesota held that an injured employe "who insists upon treatment of his compensable injury by a physician of his own choice, can obtain the reasonable value of the services rendered by such physician." While railway employes in Minnesota are not subject to the State Workmen's Compensation Act, being under the Federal and State Liability Acts, I consider the interpretation to be of great importance.

The Association has faithfully at the Legislative halls, upheld the enunciated principle and the interpretation of the State Supreme Court in support thereof.

I thoroughly appreciate the efforts of the Association in that respect as evidenced by the splendid, patient efforts of the able, genial and great-hearted country physician, Dr. L. L. Sogge, of Windom, state legislative representative for the Association, and likewise, his unremitting and faithful efforts and that of his associates in advancing and maintaining the best possible medical services at the state institutions for the handicapped.

These public institutions for those who are given treatment thereat, should be granted fully adequate appropriation for expert medical and other personnel service. Their maintenance and development should be the common concern of the great mass of the workers. The best of care should be afforded the wards of the state who come in the gerat majority of instances, from the ranks of the workers. The Association's diligent efforts as in behalf of administration of these institutions free from political influences, is likewise respectfully acknowledged.

Fraternally
G. T. Lindsten

HOW TO SECURE PAYMENT OF RELIEF BILLS

Many physicians and social welfare workers of the state are still unaware of essential procedures for securing authorization and payment for medical care of the indigent sick.

A good many misunderstandings and complaints have their source in lack of information and every physician whose practice includes any relief work under supervision of the Division of Social Welfare should familiarize himself thoroughly with the routine procedures.

The communication printed below is from Mr. Bernard W. Levander, Director of the Division of Social Welfare, and addressed to chairmen of County Welfare Boards. It is printed in full here because it presents the matter clearly and succinctly and because physicians are in equal need of enlightenment.

Letters which pass through the office of the Medical Unit of the Division of Social Welfare indicate that many physicians and social welfare workers of the state are not properly informed regarding the proper procedures for getting authorization and collecting from townships and counties for medical care of the indigent sick. In an effort to clarify procedures which should be followed, some of the pertinent details of this often controversial matter are herewith explained.

Two Types of Care

With indigent cases, as well as others, there are two types of medical care, emergency and non-emergency. Both the emergency and the non-emergency cases can be of either a surgical or medical nature. It is a common fallacy in the minds of both physicians and social welfare workers to think that emergency cases are of necessity only surgical, and vice versa that medical cases are always non-emergency. There is the medical emergency case, and also, there is the surgical non-emergency case.

Only in the non-emergency case, whether of a medical or a surgical nature, is authorization in writing necessary before a township, municipality or county can be held legally liable for the bill. The proper official to contact for authorization is shown in the accompanying outline.

In indigent emergency cases, either medical or surgical, it is not necessary for the physician to have written authorization to care for the case before the bill for medical services is legally collectible from either the township or county. It is necessary, however, that within a reasonable time after the performance of such emergency service he notify the proper authority that the service was rendered. "Within a reasonable time" has been interpreted to be within 48 to 72 hours. The proper authority to notify is the person who ordinarily issues such authorization. This notification, in order to have the bill legally collectible from either township or county, should be in writing.

County System of Poor Relief

Type of Care	*Authorized By*
Medical	Executive Secretary of County Welfare Board
Hospital	County Commissioner or Executive Secretary of County Welfare Board†

Township System of Poor Relief

Type of Care	*Authorized By*
Medical	Appropriate town, village, or city official.
Hospital	County Commissioner or appropriate town, village or city official.†

†In some counties, the county welfare board (of which the executive secretary is the administrative agent) has been empowered by the board of county commissioners to authorize hospital care.

Written Authorization for Non-Emergency Case

It is apparent in both of these procedures that authorization in writing is not necessary until the case has been fully investigated. In the non-emergency case, the very nature of the illness insures several days' time for ample investigation to determine eligibility for medical care at public expense before authorization is issued. In the emergency case, the physician should notify the proper authority and such notification should be followed within a few days by an investigation of the eligibility of the patient for such service at public cost. When it has been determined as a result of this investigation, that the township or county is properly responsible for the bill for medical services of a non-emergency nature, written authorization is issued to the physician. After notification by the physician of the performance of emergency medical or surgical services, the bill for such services should be approved as soon as proper investigation determines the eligibility of the patient for such services at public cost. Even when the care is so approved, the bill usually cannot be paid until after the next meeting of either the county welfare board, board of county commissioners, or town or village board responsible for payment.

These few points are the ones of greatest controversy between physicians and county and township authorities when bills for medical services to indigents are involved.

This same information and procedure has been released to the Minnesota Medical Association for its members.

HEALTH INSURANCE IN CANADA

The Dominion of Canada is in the process of framing and putting into effect a compulsory health insurance bill to be set in motion in the same manner as the Social Security Act of the United States, on a basis of Federal grants-in-aid.

The provinces will develop their own legislation which must meet certain standards and specifications in order to qualify for the grants-in-aid.

If, as backers expect, the act is passed by the Canadian parliament this year, it will require another year and more for provincial legislatures to act and still another year to frame administrative regulations and prepare personnel and machinery for operation.

To Cover Entire Population

Many details remain to be thrashed out but, if the plan now proposed is adopted, it will cover the entire population. The insured person will pay at the rate of $26 a year but no individual will pay more than three per cent of his income for himself. If he is without gainful occupation or income, payment will be made out of public funds. The cost for children is to be spread out over the entire population and there will be no premium for children under 16. Total costs will be borne in part by taxation, in part by employers, in part by employed individuals over 16.

All licensed physicians will be eligible to furnish care under the law and each person is to have free choice of physician for himself and his children. Compensation may be by capitation or by fee-for-service or by salary or a combination of these methods to be determined by negotiations between the verious provincial governments and committees of the profession.

Medical Association Approves

Of most interest to physicians of the United States is the fact that the Canadian Medical Association has approved compulsory health insurance in principle and committees of its Council have consulted with the National Advisory Committee on Health Insurance in working out some aspects of the bill. The bill as formulated and presented did not embrace all of the twenty principles adopted as essential to a health insurance plan in July, 1942, by the Canadian Medical Association at its annual meeting; but it seems to be generally understood that many modifications may be expected in the formulation of provincial legislation.

Back of the action taken by the Canadian Association lies a geographic and economic situation which differs widely from the United States. The vast, thinly populated sections which characterize so much of Canada have always presented difficulties in the provision of medical services. The community doctor, tried out in Manitoba and other western provinces, was one answer to the problem. It was also one step toward federally-supported government medicine.

With real difficulties to meet, on the one hand, and with compulsory health insurance already an established precedent in England, on the other, there could be little doubt about the course the Dominion would eventually take. The physicians, themselves, apparently felt that opposition would merely weaken the influence of the association in shaping purely medical aspects of the Canadian plan.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. DuBois, M.D., Secretary

Minneapolis Woman Sentenced to One Year in Workhouse for Violation of State Narcotic Drug Law

Re: State of Minnesota vs. Minnie Algren, alias Helen Barr

On June 10, 1943, Minnie Algren, thirty-eight years of age, residing in the Washburn Apartments at 612 South 8th Street, Minneapolis, was sentenced to a term of one year in the Minneapolis Workhouse by the Hon. W. W. Bardwell, Judge of the District Court. The defendant had entered a plea of guilty on June 4, 1943, to an information charging her with fraudulently obtaining narcotic drugs. The defendant complained to the physician she consulted that she was suffering from gall-bladder pains and gave a fictitious name of Helen Barr, and a fictitious address of 2210 Emerson Avenue North, Minneapolis. According to the investigation made by the Federal Bureau of Narcotics, the defendant obtained three prescriptions from the physician: the first one on May 5, 1943, for 20 1/16 gr. dilaudid hypodermic tablets; the second one on May 20, 1943, for 20 ¼ gr. morphine sulphate hypodermic tablets, and the third one on May 21, 1943, for 20 1/16 gr. dilaudid hypodermic tablets.

The defendant was sentenced in 1939, in Minneapolis, to a term of eighteen months in the Federal Women's Reformatory at Alderson, West Virginia, for violating the Harrison Narcotic Act. The defendant also paid a $25.00 fine in Minneapolis Municipal Court in October, 1939, for violating the Minneapolis City Drug Ordinance. On December 22, 1941, she was sentenced at Eau Claire, Wisconsin, to one year in the Wisconsin State Reformatory for Women at Taycheedah, Wisconsin, for violating the Wisconsin Narcotic Drug Law.

This case has again demonstrated the carelessness that surrounds the prescribing of various derivatives of opium by a small minority of the medical profession.

The State Board of Medical Examiners has repeatedly warned the medical profession against prescribing or dispensing morphine to patients who have not been thoroughly examined and who suggest the medication desired, rather than having the physician prescribe it on his own initiative. In this particular case the patient indicated that only morphine or dilaudid gave her any relief. That statement alone should put any prudent practitioner of medicine on his guard. Nevertheless, we find three prescriptions being issued during the month of May by one physician to this defendant. The physician has surrendered his Federal Stamp Tax and Government Order Book for a period of two years as a penalty for his carelessness. No decision has been made with respect to a suspension of his medical license.

Woman Sentenced to One Year Workhouse Term in Minneapolis District Court

Re: State of Minnesota vs. Margaret Heyen, alias Margaret Dent

On June 10, 1943, Margaret Heyen, thirty years of age, alias Margaret Dent, pleaded guilty in the District Court of Hennepin County to an information charging her with fraudulently obtaining narcotic drugs. The defendant was sentenced the same day by the Hon. W. W. Bardwell, Judge of the District Court, to a term of one year in the Minneapolis Workhouse. The defendant was arrested following an investigation by the Federal Bureau of Narcotics, which disclosed that between February 6, 1943, and February 27, 1943, she had obtained three prescriptions from a physician, each calling for 20¼ gr. morphine sulphate hypodermic tablets. The defendant used a false name, to-wit: Margaret Dent, and falsely stated that she lived at a Minneapolis hotel. Her correct address at the time was Apartment 5, 1020 Hawthorne Avenue, Minneapolis. It is the opinion of the authorities that this defendant is not addicted to the use of morphine but was obtaining the prescriptions in order to secure the morphine for another person. The defendant was able to obtain the prescriptions on her statement to the physician that she was suffering from a tumor and that she had to have some relief.

The defendant has a previous Court record, having been sentenced in August, 1940, to a term of one year in the Minneapolis Workhouse for grand larceny in the second degree. At that time she was placed on probation for two years. On October 29, 1942, she was sentenced to ninety days in the Minneapolis Workhouse for violation of the Minneapolis City Drug Ordinance.

VITAMIN CHECKS GROWTH OF TRANSPLANTED CANCERS

Inositol, the sugar-like compound which prevents baldness in mice and is generally considered one of the B vitamins, checks the growth of transplanted cancers in mice, Dr. D. Laszlo and Dr. C. Leuchtenberger, of Mount Sinai Hospital report (*Science*, June 4).

The degree to which the growth of the transplanted tumors is checked depends on the size of the dose of inositol. Inositol, the scientific investigators state, can be used as a standard of reference for testing other substances that may inhibit tumor growth.

Dr. Laszlo and Dr. Leuchtenberger are members of a research team which previously has reported that complete regression or disappearance of nineteen out of forty-six spontaneous breast tumors in mice followed treatment with pearled barley.—*Science News Letter*, June 19, 1943.

In Memoriam

E. T. W. BOQUIST

Dr. E. T. W. Boquist, chief medical officer at the Minnesota Soldiers Home in Minneapolis, died April 29, 1943, at the age of fifty-one.

Dr. Boquist was born in 1891. He obtained his medical degree in 1916 from the University of Minnesota. He was a member of the Minnesota National Guard at the time the United States entered the first World War and he served as a lieutenant in the army medical corps in 1917-19. From 1940 to 1942 he was a major in the Minnesota State Guard.

In 1941 Dr. Boquist made a trip to Louisiana as a representative of the Minneapolis Y.M.C.A. to investigate and report on the recreational facilities of the army camps there. He found the facilities inadequate.

Dr. Boquist was a member of the Mark Hamilton Post of the American Legion, the University Masonic Lodge, the Swedish Hospital Staff and was also a member of the Hennepin County Medical Society, the Minnesota State and American Medical Associations.

He is survived by his widow, a son William, and a daughter Marjorie.

* * *

WILLIAM VARDEMAN LINDSAY

Dr. William V. Lindsay, former Winona city health officer, died suddenly April 24, 1943, at the age of sixty-nine.

Dr. Lindsay was born October 20, 1873, in Saint Paul, Missouri. He obtained his medical degree at Missouri Medical College, Saint Louis, Missouri, in 1898 and interned at Saint Luke's Hospital in Saint Paul, Minnesota. He then took a three months' postgraduate course at Washington University, Saint Louis. He began practice in Wentzville, Missouri, and then moved to Winona.

He entered the service as a captain in the medical corps in 1917 and was discharged a major after sixteen months in service, having been stationed a part of the time in Siberia.

He served as Health Officer of Winona from 1919 until 1940. Due to the health program developed in the city under Dr. Lindsay, the city placed second in its class in 1939 in the Chamber of Commerce contest and its health methods have been used as models by the United States Public Health Service.

Dr. Lindsay married Helen Mills in 1904. He is survived by his widow, two daughters, Mrs. Charles Worley, Saint Charles, Missouri, and Mrs. Paul Berkman, Washington, D. C., and three sisters.

He was a 32nd degree Mason and a member of the Winona County Medical Society, the Minnesota State and American Medical Associations.

Roosters at the Beltsville farm of the U. S. Department of Agriculture have lived four years after the surgical removal of their gizzards, proving these to be nonessential organs.

NEW POLICIES OF STATE DEPARTMENT OF HEALTH REGARDING BIOLOGICS

A Letter to the Medical Profession in Minnesota

Recently the State Board of Health decided upon certain new policies in relation to the distribution of biologics.

1. All biologics will be distributed from the Division of Preventable Diseases, University Campus, Minneapolis. Part of the biologics heretofore have been distributed from the Saint Paul office. This seems a logical arrangement since communicable diseases are reportable to the Division of Preventable Diseases and closer contact can be kept with the needs. Secondly, this Division renders both Saturday afternoon, Sunday and holiday, as well as night service, and biologics can be distributed more rapidly. In fact, the Division of Preventable Diseases has carried the biologics emergency service on Sundays and holidays heretofore.

2. The variety of therapeutic agents offered will be increased. There has been a tremendous reduction in morbidity and mortality in certain communicable diseases for which control means and specific therapeutic treatment have been practiced for years. In others, such as whooping cough and measles, the mortality is very high in young children and since there are therapeutic agents available which are of definite value, these will be offered as far as funds permit.

3. The greatest emphasis will be placed on immunization. This is especially important since a number of new immunizing agents have proven valuable the past few years. Our population needs to be better protected than usual because of the shortage of physicians.

The various therapeutic agents will be taken up first and the policies governing their distribution.

Diphtheria Antitoxin

(Distributed by Central Station through Thirty-eight Substations)



Beginning July 1, 1943, there will be thirty-eighth diphtheria antitoxin stations. The accompanying map shows the distribution of these throughout the state. It is believed that this number will be fully adequate as driving distances, train transportation, storms, et cetera, have been taken into account.

Up to the present there have been 190 diphtheria antitoxin distributing stations in Minnesota, an average of over two per county. When such stations were originally established there was even a larger number of stations. At that time, there were several hundred deaths from diphtheria each year and thousands of cases. Now there are only six to twelve deaths a year, and less than 100 persons who have clinical symptoms of the disease. When antitoxin stations were established there were fewer trains and no automobiles. Even though gasoline is limited now, it can always be obtained for emergency use. There has been quite a loss of diphtheria antitoxin in many stations due to outdating of the biologic, which means not only a serious financial loss to the state, which could be justified if adequate protection to health could not be given with less stations, but this loss has very serious consequences due to the shortage of biologics nationally. It is of interest to study the diphtheria deaths which occurred in 1942 to June 18, 1943. It will be noted that there were twelve deaths in 1942 (as compared with eight in 1941) and there have already been eight deaths in 1943. It will be seen by Table I that these deaths did not occur because antitoxin was not available, in fact, in many instances, there was an antitoxin station in the town or hospital where the patient died. It will also be noted

TABLE I. DIPHTHERIA DEATHS IN MINNESOTA

January-December, 1942

County	San. Dist.	Antitoxin Station	Phys. called	Antitoxin		Condition when antitoxin used	Culture	Sex	Age	Died	Immunized
				Amount (units)	Day given						
Beltrami	Bemidji Twp.	Bemidji C.	about 14th day		none given	—	+ (+ Vir.)	M	2 mos.	about 14th day	no
*Murray	Lowville Twp.	Lake Wilson V. (approx. 7 mi.)	5th day	25 M U 40 M U	5th day 6th day	not given	+	M	50	6th day	no
*Murray	Lowville Twp.	(approx. 7 mi.) Lake Wilson V.	5th day		none given	—	neg.	M	4	5th day	no
*Murray	Lowville Twp.	Pipestone C.	3rd day	15 M U 20 M U 20 M U 5 M U	7th day 8th day 9th day 10th day	Cyanotic	+	F	3	16th day (Hospitalized at Pipestone for 5 days; died 10 days after discharge.)	no
Pennington	Hickory Twp. (Mercy Hosp., Thief River Falls C.)	Thief River Falls C.	2nd day	30 M U	2nd day	Terminal	+ (+ Vir.)	M	7	3rd day	no
Pine	Chengwatona Twp. (Hosp., Pine City V.)	(approx. 22 mi.) Sandstone V.	6th day	30 M U	6th day	In extremis	+	F	3	8th day	no
Ramsey	St. Paul C. (Ancker Hosp., St. Paul C.)	St. Paul C.	1st day	20 M U	9th day	difficult respiration	none examined	M	7	9th day	no
Ramsey	St. Paul C. (Ancker Hosp., St. Paul C.)	St. Paul C.	5th day	30 M U	5th day	Dyspnoea, dysphonia, cyanosis	none examined	M	49	5th day	no
Traverse	Browns Valley	Browns Valley V.	no record		none given	—	none examined	F	5	5th day	two doses ?
Yellow Medicine	Granite Falls C.	Granite Falls C.	1st day	10 M U	5th day	Cyanotic	+ (+ Vir.)	M	4	5th day	no

No. Dakota	Barney V.	Breckenridge C.	no record	no record		no record	+	M	56	42nd day (Died in St. Francis Hosp., Breckenridge C., Wilkin Co.)	no
†So. Dakota	Easter Twp.	Graceville V.	no record		none given	—	+	M	3	18th day (Died in Graceville V., Big Stone Co. one hour after arrival)	no

*Same family
†Mother died in South Dakota three days later.

TABLE II. DIPHTHERIA DEATHS IN MINNESOTA
January 1 to June 18, 1943

County	San. Dist.	Antitoxin Station	Phys. called	Antitoxin Amount (units)	Antitoxin Day given	Condition when antitoxin used	Culture	Sex	Age	Died	Immunized
Hennepin	Minneapolis C. (General Hospital)	Minneapolis C.	10th day	40 M 20 M	12th day 14th day	Poor	+ (+ Vir.)	M	58	21st day	—
Lyon	Minneota V.	Minneota V.	2nd day	40 M	7th day	Toxic	neg.	M	14 mos.	9th day	no
Lyon	Minneota V.	Minneota V.	8th day	70 M	9th day	Very toxic	+ (+ Vir.)	F	3	15th day	no
Ottertail	Elmo Twp.	Parkers Prairie V.	9th day	5 M 10 M	10th day 11th day	Toxic, difficult respiration	+	F	2	11th day (Died at Hosp., Parkers Prairie V.)	no
Ottertail	Henning Twp.	Henning V.	11th day		none given	In extremis	none	F	63	11th day	no
Todd	Bartlett Twp.	Long Prairie V. (approx. 20 mi.)	5th day	20 M 15 M	8th day 9th day	Toxic	+ (+ Vir.)	M	3	13th day	no
St. Louis	Duluth C. (St. Luke's Hospital)	Duluth C.	4th day	30 M	5th day	Cyanotic, difficult breathing	+ (+ Vir.)	M	57	5th day	?
Yellow Medicine	Granite Falls C.	Granite Falls C.	2nd day	10 M	3rd day	Cyanotic	+ (+ Vir.)	F	2½	3rd day	?

that in most instances, the physician was not called until it was too late to save the patient's life.

There appears to be some evidence that diphtheria is increasing in this state since there has been some increase in cases as well as deaths in 1943. Our epidemiological data shows that most of the communities where deaths occurred, were well immunized, but it will be noted from studying the individual cases that only one patient in this series had actually been immunized. It is important that October, 1942, was the first time that the gravis type of diphtheria organisms were identified in this state, and that in practically all fatal cases from October, 1942, from which we were able to obtain cultures, the gravis type of organism was found.

Meningococcus Serum and Antitoxin
(Distributed from Central Station)

Meningococcus serum has been furnished by the State Department of Health for many years. At times in the past few months, it has been impossible to obtain this product because the manufacturers must first fill the needs of the army and navy. The State Department will now also furnish meningococcic antitoxin as well, since there is good evidence that this is as effective as serum. There has been a definite increase in epidemic meningitis in 1943, *i.e.,* sixty-five cases up to June 18, compared with an average of twenty-three cases for the previous five years. However, there have been very few requests for meningococcic serum, no doubt because of the wide use of sulfa drugs. Although these drugs constitute adequate treatment in many cases of meningococcic meningitis, it is recognized that in certain cases serum and antitoxin are also needed. It should also be remembered that the meningococci are a variable group and that it may be found at any time that serum or antitoxin as well as sulfa drugs will be neeeded in the treatment of a higher proportion of cases.

Pneumococcus Serum
(Distributed from Central Station)

This product has been furnished since January, 1937. Since more and more efficient sulfa drugs have been developed, there has been less need for serum. However, there are certain patients on whom drugs cannot be used, or who do not respond to drugs, and in such instances serum is very essential. Because of the fact that pneumococcus typing is usually no longer an emergency, and because of the small amount of typing serum and therapeutic serum available (due to the needs of the army and navy), the Minnesota Department of Health is carrying out pneumococcus typing and therapeutic serum distribution at present *only* on an emergency basis. It is realized that it would be of great value epidemiologically to continue typing on the same basis as previously, but with lack of funds and materials, it does not seem warranted at this time, since our 1942 statistics show very little gained by this service.

Pertussis Hyperimmune Serum
(Distributed from Central Station)

In recent years, sufficient evidence has been accumulated as to the efficacy of this product to warrant its distribution. The drug will be offered only to patients under eighteen months, since three-fourths of the deaths from whooping cough in this state occur in children under one year of age.

B. Influenzæ Immune Serum
(Distributed from Central Station)

Before the advent of this product influenza bacillus meningitis was practically always fatal. Sulfa drugs are now used also, and there have been reports of some recoveries using the drug alone. However, the synergistic reaction between the drug and the serum, and chances of recovery are much greater if both are used. Since serum is very expensive, it is not often used. Although the disease may seem relatively unimportant, it is one of the commonest meningitides in children under two years. In 1942, twenty-two deaths were reported in this state. It is of interest that Pfeiffer influenza bacilli from spinal fluids were typed in seventeen cases in our laboratories and of these, ten recovered. An additional recovery was also reported from the Minneapolis General Hospital.

Measles Convalescent Serum
(Distributed from Central Station)

Since this product is of proven value in modifying measles, it will be distributed for this purpose only to children under eighteen months of age, since the majority of deaths occur before the above age.

Biologics for Immunization
Diphtheria-Tetanus
(Distributed from Central Station)

In the past both alum-precipitated diphtheria toxoid and fluid diphtheria toxoid have been distributed. Now that sufficient statistics have been compiled to demonstrate that in varying doses, one is as effective as the other, it would seem more desirable to distribute only alum-precipitated toxoid, since only two doses are required. It also should be pointed out that there are no more untoward reactions from the alum-precipitated toxoid than the fluid toxoid, even in older age groups. Since it is now also demonstrated that alum-precipitated tetanus toxoid gives an excellent immunity, it would also seem advisable to distribute this biologic. Although the number of tetanus deaths in this state each year is small, there are on the other hand, a considerable number of injured persons who receive prophylactic tetanus antitoxin, and who may become sensitized to horse serum. It would, therefore, seem better practice to immunize young children with a combination diphtheria-tetanus toxoid since in case of an accident which otherwise would require tetanus antitoxin, merely a step-up dose of tetanus toxoid is required. Another reason for combining these two products is that higher immunities apparently result without increase in reactions than would result if the two antigens were used separately. There is some diphtheria toxoid now on hand which can be used, but in the future only diphtheria-tetanus toxoid will be supplied. It is requested that the physician plan on at least five immunizations at a time, since due to cost, this product cannot be

distributed in single immunizations. *Babies should be immunized between eight and twelve months, or any time after six months.*

Smallpox Vaccine
(Distributed from Central Station)

In the past, the Department has distributed this only for groups. In the future, it will be given for single immunizations also. *Babies should have first vaccination by the first birthday.*

Pertussis Vaccine (Sauer)
(Distributed from Central Station)

Although this immunizing agent is still on an experimental basis, there is sufficient evidence to warrant the encouragement of its use. Because of the high fatality early in life (see above), this product will be distributed only for use in children under two years. It preferably should be the first immunization agent given and should be started *at age of six months or soon after.*

Typhoid Vaccine
(Distributed from Central Station)

This product has been manufactured and distributed by the Department Laboratories for about thirty years. Throughout the years, the vaccine has been made from typhoid and paratyphoid stock obtained from the Army Medical School and the exact methods used by them is followed in the manufacture of this product. Both plain and triple vaccine are made and it is distributed to any physician who requests it.

Tuberculin
(Distributed from Central Station)

This biologic, diluted for use, has been distributed for a number of years to physicians, and the product is sent out automatically every two weeks to physicians whose names are on our list.

Silver Nitrate Ampoules
(Distributed from Central Station)

This product has been distributed for many years and is distributed to any physician, accredited hospital or licensed midwife, upon request.

Arsenicals and Heavy Metals
(Distributed from Central Station)

Under certain conditions, drugs for the treatment of syphilis have been furnished since 1918. Since February, 1931, these drugs have been supplied for the treatment of needy patients on request from their physicians under the condition that each case be reported with the usual case data. (A special information sheet relating to the distribution of anti-syphilitic drugs will be sent to any physician on request.)

At a meeting of this Board April 9, 1943, Dr. Erling S. Platou, president, and Dr. Ruth E. Boynton, vice president, were appointed to serve as a committee to confer with and advise the members of the staffs of the Divisions of Administration and of Preventable Diseases in regard to the recent changes in relation to the distribution of biologics as given above.

From this date all requests for biologics and all inquiries concerning same should be addressed to the Division of Preventable Diseases, Minnesota Department of Health, University Campus, Minneapolis.

I wish to take this opportunity to thank the physicians and health officers for their coöperation in the past and to assure them that it is our desire to be of the greatest possible help to them in the protection of the public health.

Very respectfully,
A. J. Chesley, *Executive Officer,*
Minnesota Department of Health

A GUIDE FOR SETTING UP POLICIES AND PHYSICIANS' RECOMMENDATIONS FOR LOCAL PUBLIC HEALTH NURSING SERVICES

(May 1943 Revision—Approved by the Minnesota State Medical Association)

General Policies

It is highly important that public health nursing practices be consistent with the medical practices of the community. Accordingly, the Minnesota State Medical Association, the State Organization for Public Health Nursing, and the Division of Public Health Nursing, Minnesota Department of Health, submit a sample of minimum policies involving nursing procedures and instructions as a basis for guidance of local public health nursing agencies. It is intended that these minimum policies will be found sufficiently flexible to meet various local needs. They are as follows:

1. An agency employing public health nurses should have its basic program and contemplated changes approved by the physicians in the community.

2. The nurse emphasizes the importance of medical care, but she does not recommend the selection of an individual physician. She gives bedside nursing care under the direction of a licensed physician. Public health nurses working under the direction of local physicians may *give and read various diagnostic tests provided approval* has been given by the physicians of the community.

3. In special cases of economic need the public health nurse shall use the facilities provided by public and private agencies in coöperation with the family physician.

4. Records of nursing care should be kept on file by the nurse. The nurse should make a written report to the physician or agency whose patient she has contacted. Such report may be given to the patient to take to the physician, or may be delivered directly to

the physician. Carbon copies should be kept on file—a form is suggested in the Nurses' Manual supplied by the Minnesota Department of Health. In addition to reports requested by the local agency, the nurse shall make written reports through the board employing her to the state and local boards of health on such form and at such times as prescribed by the State Board of Health.

5. The establishment of clinics or other health activities which involve medical service shall be undertaken only upon the approval of the County or District Medical Society, or by the physicians in the community.

6. Every public health nurse should understand and support the state and local health laws and regulations and keep in direct contact with the local and state health departments.

7. Every nurse engaged in public health nursing should be approved by the Committee on Certification, for which provision has been made in the Minnesota State Health Laws and Regulations.

8. It is suggested that all public health nurses at the time of employment, and periodically as requested by the employing agency or the State Board of Health, present a satisfactory personal health record which includes recent smallpox vaccination, evidence of immunity to diphtheria, and freedom from active tuberculosis as determined by tuberculin tests and/or x-ray pictures of chest and other procedures as indicated.

9. The shortage of nurses now existing necessitates the use of reliable auxiliary workers in order to supply the necessary nursing care in homes. The public health nursing agency may with the approval of the family physician assign simple nursing duties to persons who have had training for such work. For example nurses' aides, practical nurses, subsidiary workers, and others who have had a course in home nursing. These women will receive guidance from the public health nursing agencies.

Physicians' Recommendations on Care of Patients

The following recommendations are submitted to physicians for their approval to be used as a guide to the nurse in her administration of nursing care, treatment, and medication in those emergencies where no physician is in attendance, when orders have not been left by the attending physician, or when the nurse has been unable to reach the physician for orders.

Physicians' recommendations to nurse are concerned with:

1. Teaching content of health education in the home and school or health center regarding the health and environmental sanitation of the family.

2. Nursing care of sick persons under or pending medical direction.

Emergencies and Accidents—All nurses are expected to be familiar with the technique adopted by the American Red Cross for first aid treatment and injuries, and in caring for such conditions she will limit herself to these accepted procedures. In the event of a severe accident immediate medical care should be secured by calling the nearest physician or hospital if it is not possible to locate the physician of the family; and if the patient is a minor, communicate with the parent or guardian immediately.

Communicable Disease Control—The control of communicable diseases is the responsibility, not only of the public health nurse and the official agency, but is also the concern of the medical profession and general populace. If communicable disease is suspected the nurse should explain to the family the elementary principles of isolation, concurrent and terminal disinfection, and such other measures which will aid in preventing the spread of disease. (See "Home Isolation Procedures" Manual for Public Health Nurses, Minnesota Department of Health.)

If the patient is attending school, the school official should be notified in writing in order that contacts of the patient may be properly observed. The health officers of the sanitary districts in which the school is located and in which the child resides should be notified of the occurrence of suspected communicable disease as provided by Regulation 318 of the Minnesota State Health Laws and Regulations. The nurse is expected to make the patient as comfortable as possible and to isolate him from all other persons. Any of the following symptoms shall be considered sufficient reason for such isolation:

Fever 100° or more	Sore throat
Coryza	Vomiting
Rash	Inflamed eyelids
Running ears	Pediculosis

Skin lesions suggesting scabies or impetigo

In aiding physicians in the control of preventable diseases public health nurses are expected to coöperate with the local health officer and to follow the Regulations of the State Board of Health as outlined in Chapter 6 of the Minnesota State Health Laws and Regulations as issued by the Minnesota State Board of Health.

It is important that educational phases of smallpox vaccination and diphtheria immunization and other immunization such as prevention of whooping cough and measles be kept constantly in mind. The nurse should teach families that such immunizations are best done before the end of the first year and repeated at the discretion of the physician. Group immunization programs should be conducted under the auspices of a local medical society which may secure available biologics from the Minnesota Department of Health. The nurse's contribution to such programs consists of preliminary education of the community, making the necessary arrangements for carrying through the programs, assisting the physicians when the immunizations are being performed, summarizing reports, and keeping local records of immunization.

Tuberculosis—Infectious and potentially infectious cases (active or with tubercle bacilli in sputum) should be isolated preferably at a sanatorium following the diagnosis and recommendations of the attending physician or health officer. Such cases while awaiting admission to the sanatorium should be completely isolated at home. (See communicable disease isolation procedure in Public Health Nursing Manual supplied by the Minnesota Department of Health.) Special attention

should be given to adequate terminal disinfection after patient has left the household. Hospitalization should also be advised for other forms of tuberculosis on the approval of physician. Medical examinations, including tuberculin tests and x-ray pictures, if necessary, should be urged for all members of the family and other close contacts of tuberculosis cases.

Syphilis and Gonorrhea—As problems in relation to syphilis and gonorrhea are encountered or brought to the attention of public health nurses, all available information regarding these problems should be referred to the Division of Preventable Diseases, Minnesota Department of Health, for consultation and advice regarding future responsibility of the nurse. When cases are known to be under medical care, problems relating to them should first be discussed with the attending physician.

Public health nurses should always bear in mind that information relating to venereal disease should be kept confidential. See Regulation 2510, Minnesota State Health Laws and Regulations.

Health of Mothers—The public health nurse's work with mothers and infants is an important part of public health service. She should secure standing orders from individual physicians for treatment and nursing procedure to be carried out for these individuals.

In working with expectant mothers the aims should be to bring the women under early and continuous medical care; to teach the elements of prenatal hygiene; and to carry out nursing care or treatments ordered by the physician. Specific help which public health nurses may give to mothers is: help arrange for delivery care for the mother, and immediate care for the new baby. Plan to have a registered nurse present during delivery if possible. Demonstrate the preparation of sterile supplies when a home delivery is planned. Give emergency care in event of postpartum hemmorrhage—send for the physician, massage uterus against sacrum, keep patient quiet and warm, and carry out the measures recommended in the treatment of shock. Give bed-bath and perineal cleansing (demonstrate to attendant). Give treatments ordered by physician (demonstrate to attendant).

The nurse emphasizes the value of rest and other aspects of hygiene during the involution period and the value of the postpartum medical checkup. A most important phase of maternal care is instruction in the value of breast feeding for the baby with its attendant physical and emotional preparation of the mother for a successful breast feeding experience.

Health of Infants and Young Children—The birth of a premature infant is an emergency in which the public health nurse must be prepared to function under the direction of the attending physician. A definite prearranged program of coöperation between the physician and the public health nursing service will enhance this program. The nurse's contribution of aid and instruction in maintaining body temperature, feeding techniques, isolation and other nursing care can be invaluable.

A most important phase of public health nursing is instruction in care, feeding and immunization of infants. Every effort should be made to contact the mother of the new infant within forty-eight hours after birth in the home or baby's return from the hospital.

The definite decline in breast feeding challenges the public health nurse to encourage mothers to nurse their infants. The nurse must be familiar with the various techniques involved. She must make sure that there are no contra-indications.

The prophylactic protection of the baby's eyes and registration of birth as required by state law is the nurse's responsibility when there is no doctor in attendance.

The nurse should concern herself with guiding parents of preschool children in habit training, adequate nutrition, good hygiene and immunizations. Close cooperation should prevail between nurses and organizations such as the Congress of Parents and Teachers, American Legion Auxiliaries, and others particularly interested in promoting such special health programs as child health conferences, dental health projects, etc., for the preschool child.

Health of School Children—The public health nurse in school health work is usually under the immediate direction of the school administrator. In addition, the Nursing Advisory Committee or the School Health Council each with medical, dental, and lay representation helps guide the service. The object of the school health program is to coöperate with physicians and dentists to improve the health of school children by making the health examination an educational experience, not only for the child but also for the parents and teachers. The nurse consults with parents on problems of child health and environment and guides parents to other sources of aid which may be needed.

An important part of the school nurse's work is to aid in the control of communicable disease by helping parents and teachers recognize conditions for which the child should be isolated. Regulation 318 of the State Board of Health Laws and Regulations provides for reporting children who are ill to the school physician for medical examination. On the other hand where there is no school physician "it shall be the duty of the teacher or head of the school to exclude from school all pupils, who, in his opinion, show signs of a communicable disease." A nurse may perform these duties when so directed by the school physician or the health officer.

Morbidity—Nursing service rendered by public health nurses to patients ill from any cause is included under this category. In this service the physician-nurse cooperation is necessary to the welfare of the patient. The public health nurse must make every effort to keep the physician informed of services she has given to the patient and progress she has observed. Except in services where the policies include bedside nursing, the

public health nurse cannot be expected to give continuous bedside care to an individual; first, because of the need for equitable distribution of all phases of a generalized service to all sections of the community; and second, because of the possibility of disrupting the balance of a generalized program. However, where medical and hospital personnel are reduced the public health nurse working under medical direction may render care to the sick in their homes for demonstration and teaching purposes thus giving vital assistance to physicians as well as improving the care of the patient.

Whenever the public health nursing agency has assigned nursing duties to an auxiliary worker, a public health nurse will visit the case frequently enough to know that treatment and care are given as ordered by the physician.

It is generally accepted that the first morbidity visit may be made without or before a physician is in attendance. Standing orders should include definite regulations regarding subsequent visits as well as policies to guide the nurse on the first visit. At the first call every effort should be made to have the patient contact the physician of his choice. The physician will then give orders to the nurse for subsequent visits. Written or telephoned reports to the physician are desirable, both for the first and subsequent visits. Ordinarily, repeat home visits, when there is no physician in attendance, are made chiefly to urge medical supervision and to secure diagnostic information to be reported to the family or welfare physician or health officer.

Crippled Children's Services—The State Service for Crippled Children is complete and extensive—even so, it requires full coöperation of all interested local agencies to fulfill its functions. Therefore, the prevention and correction of physical handicaps due to bodily defects is an important duty of public health nursing. This is especially true because nearly all these conditions need supervision over long periods of time in order to be cured. The nurse works with the individual physicians in the care and supervision of these cases.

Proper prenatal care, adequate delivery service, and effective training of the mother in the care of the newborn are preventive measures. Due to the close contact with the patient the public health nurse may discover deviations from the normal—not only in the infant, but also in the pre-school and school child. The parent must be made to see that the child requires regular and continuous medical care.

Records of local orthopedic and cardiac cases and those of other physical defects should be as complete as possible and checked frequently with the state field representative of Bureau of Crippled Children Services. The nurse's duties in the individual case lie in the education of the family in the care, the demonstration, and instruction in home nursing, the general health supervision of the afflicted child, and the supervision of therapeutic exercises recommended by the physician in charge. Actually, the nurse will aid in every way the rehabilitation of the patient.

NOTE: This above guide for Public Health Nursing Service has been approved by the Council of the Minnesota State Medical Association and is published for the information of the profession.

PROCEDURE FOR COLLECTING MEDICAL BILLS FOR SERVICES TO THE INDIGENT

April 7, 1943

Mr. R. R. Rosell, Executive Secretary
Minnesota State Medical Association
Saint Paul, Minnesota

My dear Mr. Rosell:

Judging from letters which pass through the office of the Medical Unit of the Division of Social Welfare, many physicians of the state are not properly informed regarding the procedures necessary to collect bills from townships and counties for medical care of paupers or the indigent sick. In the light of this fact, the suggestion has been made that I write you some of the pertinent details of this controversial matter with the hope that the information be circularized in some manner to the physicians of Minnesota.

With indigent or pauper cases, as well as others, there are two types of medical care, emergency and nonemergency. Both the emergency and the nonemergency cases can be of either a surgical or medical nature. It is a common fallacy in the minds of both physicians and social service workers to think that emergency cases are of necessity only surgical, and vice versa that medical cases are always nonemergency. There is the medical emergency case, and also, there is the surgical nonemergency case.

Only in the nonemergency case, be it of a medical or a surgical nature, is authorization in writing necessary before a township, municipality or county can be held legally liable for the bill. Such authorization must be obtained from the chairman of the town board in a county operating under the township system of poor relief, or from the executive secretary of a county welfare board in a county operating under the county system of poor relief. Even in some counties operating under the township system of relief, the executive secretary of the county welfare board is delegated to issue such authorizations.

In indigent emergency cases, either medical or surgical, it is not necessary to have written authorization to care for the case before the bill for medical services is legally collectible from either the township or county. It is necessary, however, that within a reasonable time after the performance of such emergency service the proper authority be notified that the service was rendered. Within a reasonable time has been interpreted to be within 48 to 72 hours. The proper authority to notify is the chairman of the town board, or the executive secretary of the county welfare board. The method of notification, in order to have the bill legally collectible from either the township or county, is in writing. Not only is it advisable to keep a duplicate copy of such notification, but a return receipt from a registered mailing of the notification should be secured.

It is apparent in both of these procedures that authorization in writing is not necessary until the case has been fully investigated by the proper social service work-

(Continued on Page 669)

Minneapolis Surgical Society

Meeting of November 5, 1942

President, Richard R. Cranmer, M.D., in the Chair
Secretary, R. F. McGandy, M.D.

NONCLOSURE OF WOUNDS IN ACUTE APPENDICITIS AND THE USE OF THE GIBSON-MICKULICZ TAMPON

ARTHUR F. BRATRUD, M.D.

Minneapolis, Minnesota

Definite advances in the treatment of acute appendicitis have been made ever since surgical removal was advised for its treatment and cure. Ochsner's treatment was quite universally recognized as the method of choice for years, and later this was very much improved by the use of intravenous solutions, duodenal suction, and supportive measures. Very little attention and very little publicity has been given to the nonclosure of wounds which was used by MacLaren as early as 1904, and also by Gibson who stresses the importance of the Gibson-Mickulicz tampon in the suppurative and ruptured type of appendicitis. It is my aim to present this phase of the treatment of appendicitis as well as to present a summary of the cases treated by myself at new Asbury Hospital.

All patients with acute appendicitis cannot and should not be treated by the same procedure. The treatment should be individualized. Ochsner's old dictum that after 48 hours all patients with appendicitis should be treated by conservative measures should be abandoned. Most such individuals should have surgical interference as soon as seen. However, when a patient is seen late and rectal examination shows an abscess in the cul-de-sac, this patient should be drained by rectum and then an interim operation performed as the mortality rate with this procedure is practically nil. In a fulminating case of appendicitis, it is better to remove the appendix and use either a McBurney incision with non-closure of the wound plus rubber tissue drains or a Gibson-Mickulicz tampon which should be removed from the second to the fourth day. Drains after this period are of no value except to drain a very limited area. If a right rectus incision is used, then a Gibson-Mickulicz tampon, which will be described later, should be used. If a Gibson-Mickulicz tampon is not available, a rubber glove can be used in a similar manner. Much too little attention has been given to the recognition and treatment of acute appendicitis with peritonitis or abscess by the methods mentioned.

Some 339 cases of acute appendicitis have been reviewed. The leukocyte count varied from 6,200 to 47,000.

The duration of stay in the hospital varied from five to forty-one days, with an average of 10.98 days of hospitalization. Of the series, there were 330 immediate operations, the appendix being removed in all but one case. This was a case with a very large abscess which had been present for several weeks, and no attempt was made to locate the appendix. Local anesthesia, local anesthesia with nitrous oxide, ethylene, ether or spinal was the choice of anesthesia in the order mentioned in every case. Consideration was given to a patient's objection to local anesthesia. Nine patients were not operated upon immediately, except that rectal drainage was performed on three as soon as an abscess in the pelvis pointed sufficiently low down to make this procedure free from danger. Six patients were treated conservatively with hot packs, nasal suction and intravenous solution until the blood picture appeared more favorable. These were individuals who showed definite signs of a general spreading peritonitis, general rebound tenderness, tenderness over the entire abdomen, distention, marked nausea or vomiting. Those who had drainage with nonclosure of the wound had an average stay at the hospital of 19.14 days. In this series there were forty-two such cases. There were three deaths in 339 cases giving a mortality rate of .9 per cent.

Gibson-Mickulicz Tampon.—The drain (Figs. 1 and 2) is described by Gibson as consisting of an outer enveloping layer of dental rubber dam or gutta percha. It should be cut in squares measuring anywhere from twelve to twenty inches, depending upon the size of the cavity. If it is folded as per sketch in the form of a cornucopia, the apex, which will be at the lowest part of the drain, is cut off so as to leave a hole about a centimeter in diameter. Similar areas should be cut out about one or one and a half inches above and apart as in Figure 2. When the drain is inserted into the abdominal cavity, the index finger is placed at its apex. (Fig. 3) and carried to the bottom of the cavity. The edges of the rubber drain are then spread out and gauze strips are packed into the drain so that the intestines are held away from the wound edges. The gauze is removed in from twenty-four to forty-eight hours, and the entire drain is seventy-two hours. By this time there is a well walled off cavity with wide open drainage and with the omentum and bowel held away from the wound edges.

Complications.—Only one patient developed a subdiaphragmatic abscess. This patient was drained by a posterior, extra-pleural, extra-peritoneal approach, and made a very nice recovery. Only one patient devel-

oped intestinal obstruction. This was relieved and good recovery ensued. Only two postoperative hernias were operated upon and nothing definite is known in regard to the number of other patients who may have developed hernias postoperatively as it is impossible for a patient to diagnose an incisional hernia, except when the protrusion is so large that it cannot be mistaken for any other condition.

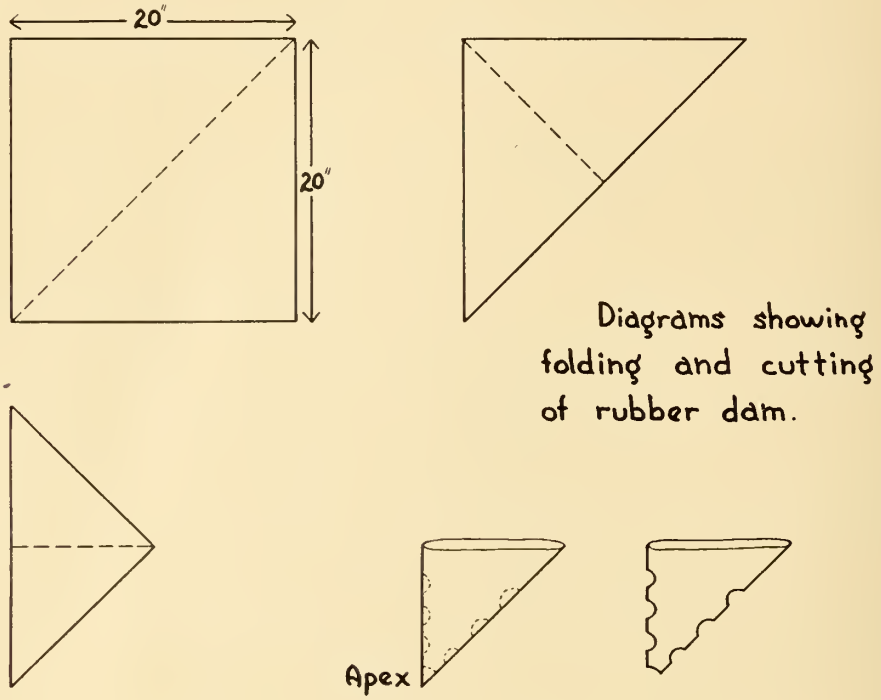


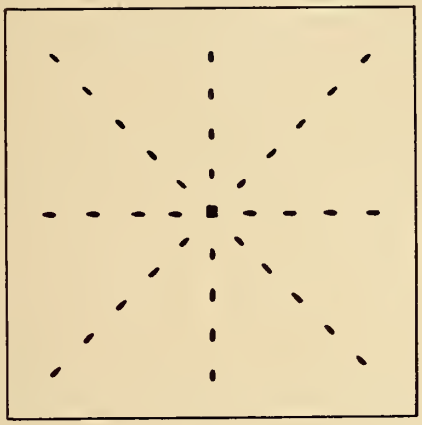
Fig. 1.

Operative Procedure.—Where a positive diagnosis was made, a McBurney's incision was always the incision of choice. If the appendix was retrocecal and difficult to remove, the incision was extended upward and the muscles spread higher up as in a McBurney incision, and the appendix was then removed retrograde through the higher abdominal opening without cutting or traumatizing the muscles severely. The appendix stump was inverted if this could be performed easily, although I can see no material advantage in the procedure. When the appendix was gangrenous, the gangrenous meso-appendix was removed as completely as possible with high ligation of the vessels with the idea that this method would probably aid in preventing hepatic or subdiaphragmatic complications. Where gangrenous appendices were found and operation was performed within thirty-six to forty-eight hours, the wounds were closed without drainage, unless the involvement had reached the state of a soft macerated mass. If an abscess, localized peritonitis, or general peritonitis was present, non-closure of the wound with either type of drainage was performed. Strapping of the wound is performed by using a two-inch strip of adhesive which has been flamed with either an alcohol lamp or a flame made by pouring a small quantity of ether on a piece of cotton held with a forceps.

Drainage.—In the presence of a ruptured appendix or an abscess where a McBurney's incision was used, a rubber tissue drain was inserted into the lateral gutter or into the cul-de-sac or both, depending upon the location of the appendix. If a large quantity of pus was found, a Gibson-Mickulicz tampon was used. If the appendix was retrocecal, then a drain was inserted in the lateral gutter as well as into the cul-de-sac. Where a right rectus incision was used, and a general peritonitis was present or an abscess was found, a Gibson-Mickulicz tampon was inserted. The peritoneum was closed loosely around the drain, and the wound was then strapped with two-inch flamed adhesive, the adhesive passing across the abdomen from well out over the iliac crests. Care should be taken so as to evert the skin edges. No sutures are placed in the muscle, fascia, or skin in either incision.

Observation of Wound.—These wounds heal by primary union except in the drainage area, and without any evidence of infection in the tissues. To lessen the element of a postoperative hernia, a number of years ago I applied clamps or homostats to the edges of the fascia so as to bring the fascia edges together, and then removed them in forty-eight hours. Infection of the fascia with sloughing always followed and required a much longer stay in the hospital and without

doubt, an increased chance for the development of postoperative hernia on account of the sloughing of the aponeurosis of the external oblique muscle. This observation shows that fascia does not tolerate trauma in



Showing distribution of holes.

Fig. 2.

the presence of infection, and that it must be handled as carefully as other tissues. Another interesting observation was the fact that if these patients developed a hernia, the repair of the hernia would be the same as closing any operative wound as there had been no sloughing of the fascia or muscle. Where there has been an infection in a wound and a hernia resulted, the fascia as well as the muscle is usually separated widely. Practically all wounds are healed completely in from fourteen to twenty-one days. In cases where no suture had been used in the abdominal layers, the fascia was thicker and stronger at the hernial opening than laterally or mesially where it was of the normal thickness. This is just the opposite of what is found in incisional hernia which follows wound infection.

When wounds are not sutured and drains are used as above described, the patient's convalescence is much smoother. There is no induration, infection, stitch abscess, or residual abscess in the abdominal wall. No sloughing of the fascia results unless it has been traumatized. No phlegmonous or gangrenous condition of the wound is ever seen, as so frequently happens when the wound has been sutured in the presence of a severe infection. There can be no question but that the added toxemia from a badly infected or sloughing gangrenous tissue may be a big factor in determining the outcome. It is a well-known fact that the peritoneum is very resistant to infection and will tolerate a large amount of trauma. It is a fallacy to believe that drains left in the abdominal cavity for more than two to four days serve any purpose except to drain a very small walled off area. There is no pain in these wounds postoperatively. Eviseration can occur, but the danger of this is so extremely small, that it does not require consideration.

Conclusions

1. Abscesses pointing in the rectovesical pouch should have transrectal drainage.

2. There is less danger of spreading infection with

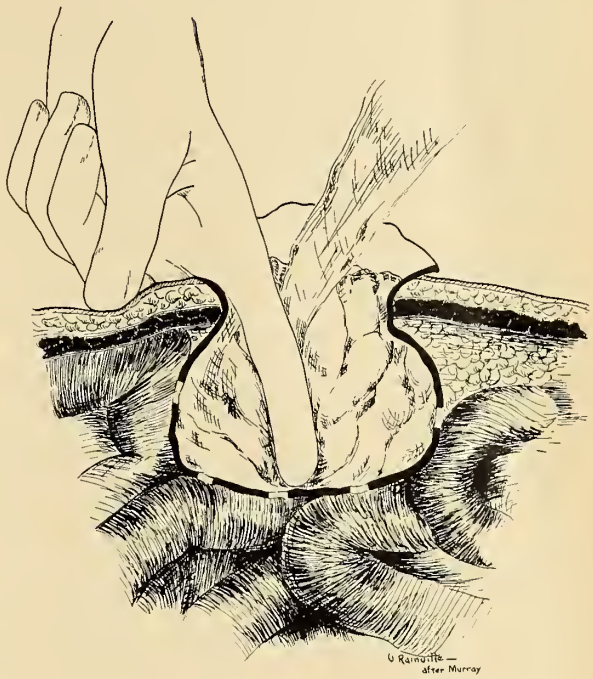


Fig. 3. Method of introduction of tampon.

a McBurney incision and rubber tissue drains than with a right rectus incision and a Gibson-Mickulicz tampon.

3. The mortality rate can be lowered by the nonclosure of wounds and the use of rubber drains or a Gibson-Mickulicz tampon as described.

4. With nonclosure of wounds, there is never any infection, phlegmonous infiltration, or sloughing of the tissues, unless they have been traumatized.

5. There is less postoperative pain and convalescence is much smoother in nonclosure than when the wound has been sutured.

6. The danger of evisceration and hernia is no greater with this method of surgical treatment than when the wound has been sutured.

Discussion

Dr. R. C. Webb: This presentation of the use and value of the Gibson Rubber Dam Tampon method of drainage in certain cases of appendicitis greatly interests me because it was in October 1923 that I presented a paper before this society on the same subject. I had introduced this method of drainage on the surgical service of Doctor A. A. Law at the University Hospital. Doctor Archibald MacLaren had become interested in the procedure and very kindly attended our meeting and opened the discussion of my paper. Since that time the method has very slowly gained some acceptance in this vicinity, and I of course feel that Doctor Bratrud should be commended highly for bringing it again before the society in this convincing manner.

When Doctor Gibson used this rubber dam tampon drain at the New York Hospital he often called attention to the comfort and to the freedom from pain which this drain afforded the patient. We used this drain on his service only in the cases which were the most severe and which called for the most extensive drainage. Such cases were at that time treated in some places by the nonoperative, so-called conservative, method. In a series of one hundred and twenty cases where this drain was used at the New York Hospital, published in 1916, the mortality was 12.3 per cent. When one remembers that these were charity patients in a large city more than twenty-five years ago, before the days of Miller-Abott tubes, intravenous vitamins, and sulfa drugs, we must realize that the mortality statistics compare more than favorably with the nonoperative reports of today. At that time all cases of appendicitis were operated upon on Doctor Gibson's Cornell University Service. There were no cases subjected to the nonoperative treatment in his clinic although Deaver in Philadelphia and Ochsner in Chicago were advocating nonintervention in certain types of cases of appendicitis.

Some of the deaths in operated cases of appendicitis can, I believe, be attributed to an infected wound. The infection in other wounds can kill patients, and I see no reason why the added burden of an infected abdominal wound cannot be an extra load which causes the death of a person who is battling peritonitis. Those who have had experience with the rubber dam tampon method of Gibson and who understand its use know that there is no appreciable infection of the abdominal wounds.

When the rubber dam tampon drain is used there are fewer fecal fistulas than with many of the other methods. There are fewer hernias than with other methods of drainage. Doctor Bratrud's colored pictures have shown the beautiful healing of these wounds. Those who are unfamiliar with this method are always astonished when they are told that they are looking at a healed abdominal wound which has healed without the use of a single stitch. Hernias occurred in 17.5 per cent of a series of one hundred twenty cases reported by Gibson. We should not be worrying about hernias when we are attempting to save lives endangered by appendicitis. However, if a hernia does occur with the Gibson drain it is not difficult to repair because we did not have an infected wound with sloughing fascia, but we had an uninfected wound with all of the layers intact and they can be separated and sutured easily.

Doctor Gibson spoke of his rubber dam tampon method as a modification of the Mickulicz drain. The drain which Mickulicz used was a square of gauze with a stout piece of silk fastened in its centre. The square of gauze was placed in the area to be drained and gauze wicks were packed into this square of gauze, and the piece of silk was brought out through the center of the series of gauze wicks. After five to seven days the gauze wicks were removed by Mickulicz, and then the square of gauze was pulled out by means of the string. Gibson's associates called the rubber dam tampon the Gibson drain. One does not need a general anesthetic to remove a Gibson drain, and this alone should justify an American name for this American method of drainage.

Dr. James Hayes: I was interested in hearing Dr. Webb discuss his experience with the Gibson Drain once more. No doubt it was a good drain and accomplished its purpose. I used this type of drain several times after listening to Dr. Webb twenty years ago.

I find now that a drain many times smaller will do just as well. I use the large antiseptic pack on the abdomen with every ruptured appendix. This serves a dual purpose. It reduces the virulence of the infection and keeps the wound wet and draining. When a wound becomes dry the drainage stops; if wet, drainage continues. If used properly nothing will give a better wound in these cases. Many surgeons advise spinal anesthesia in these cases. It gives a quiet abdomen and does not scatter the pus and infection.

Dr. Stanley Maxeiner: With reference to Dr. Hayes' remarks concerning the use of spinal anesthesia, I agree with him to the utmost that spinal is a marvelous anesthetic, especially in selected cases. However, I would call attention to Babcock's warning that those cases depleted by sepsis and by intoxication, the result perhaps of obstruction, in whom there is already greatly reduced resistance and lowered blood pressure, should not be given a spinal anesthetic.

I visited Babcock personally at the time that he had done fifteen thousand spinals and saw him operate upon a patient with peritonitis and another with intestinal obstruction under local anesthesia. He warned at that time that those patients with reduced general vitality and waning blood pressure should not be operated upon under spinal anesthesia.

Dr. Willard D. White: That the question of appendicitis and the treatment of this condition and its complications are of general interest and great importance is proven by the fact that almost anytime these subjects come up for discussion either at a regular meeting or at an informal gathering such as occurs in the staff room of almost any hospital a lively debate is apt to follow. I would like to emphasize what Dr. Bratrud has brought out that when an abscess has formed in the region of the appendix the incision should be made if possible directly over the abscess. Consequently a McBurney incision is more frequently to be used when an abscess has formed. In my opinion it is advisable to remove the appendix if it can be done without spreading the infection by breaking down the abscess wall and also there is a very distinct advantage in avoiding the use of any sutures and packing the wound open. I have used a rubber glove for this purpose many times. This of course is a modification of the old Mikulicz gauze pack which was modified by Gibson in the use of a perforated rubber dam. The rubber glove with the fingers cut off flush with the hand part of the glove makes a convenient device. Gauze strips are pulled down through the wrist and hand part of the glove and one strip comes just barely through the opening made where each finger is cut off. This makes one big drain which can be inserted in the abscess cavity and the hand and wrist part of the glove are then stuffed with gauze. No sutures are used in any of the layers. If the packing is properly put in it will keep the intestines from extruding. The first postoperative day the gauze is begun to be removed and usually each day a little more is taken out, so that the whole drain is removed in four to five days. Avoiding the use of any stitches will avoid the formation of slough and infection in the abdominal wall.

Appendicostomy is a procedure which is very useful in cases of ruptured appendicitis associated with diffuse general peritonitis. This has been used for many years. It was written up in the *Annals of Surgery* in 1934 by Eli Sherman Jones, and many surgeons had used this method for many years previous to that. After the appendix is removed a catheter about size 16 French is introduced into the cecum through the stump of the appendix and sutured in place with plain catgut. The catheter is brought out through the omentum and abdominal wall. This allows the escape of gas and fluid and is very useful in preventing distention of the colon which is so apt to imperil the circulation and peristalsis of the colon. It also enables the introduction of normal salt into the colon.

Dr. Ivar Sivertsen: I am very happy to say a few words about Dr. Bratrud's subject. Some years ago we reported a series of appendicitis and peritonitis cases, localized or generalized, only, however, about 139 cases. In this series we had nine deaths. The patients who

died had all been ill for about six days. At this time we were using ether in the belly cavity, which also means chemotherapy. In the past few years we have used chemotherapy (sulphanilamide) in all cases of peritonitis, localized or generalized, without a death. Our procedure is to use 8 Grams of the sulpha drug per 100 pounds of body weight. The Roosevelt Hospital in New York City has reported 300 cases of appendicitis with abscess or peritonitis without a death, using the same amount of sulfanilamide and a small Penrose drain. The drain is left in place for twenty-four to forty-eight hours. We have found a simple method for removing the drain, to wit: grasping the end of the drain with an artery forceps, twisting it in the form of a rope, and in this manner it comes out very easily and does not bring out bowel or omentum. We also give sulfa drugs intravenously and orally after the operative procedure. We have been a bit skeptical about leaving the wound open in these cases. Postoperative herniæ have been few. If a postoperative hernia needs repair, we simply open the skin and fascia, bring the muscles across without making an opening into the abdominal cavity. The question of anesthesia is important only to the extent that whatever anesthetic is used, one should be certain that the patient does not have too much of it. Our incision has been a modified right rectus. The right rectus muscle is pulled medially. There is no difficulty in reaching the peritoneal cavity, and the incision is extended upward or downward as necessary.

As to a tube in the cecum, mentioned by Dr. White, I believe Dr. Cooney of Princeton, Minnesota, was the first to use this procedure thirty or more years ago. I never invert an appendix and, since using cigarette drains, have never had a fecal fistula.

Dr. A. Bratrud (closing): I wish to thank the various members for the very liberal discussion. The time for removal of drains has always been a much discussed point. It is useless to allow any drain to remain in the abdominal cavity for more than forty-eight to seventy-two hours. Experimental work on dogs has shown that a drain placed in the abdominal cavity is practically walled off in six hours.

As to the value of sulpha drugs, they no doubt have value whether the wound has or has not been sutured. It is not necessary to use these drugs in the wound as it never becomes infected unless the tissues have been traumatized. Time and statistics will confirm the present opinion that the sulpha drugs in the peritoneal cavity do have definite therapeutic value in suppuration, local, or general peritonitis.

In regard to postoperative hernia, I believe there is much less danger of these developing where wounds are not sutured in the presence of infection, than when the wound has been closed with a resultant infection of the abdominal wall. Observation has shown that there is proliferation of the fascia in these drainage cases and not suppuration, sloughing, induration, or even gangrenous destruction of the tissues of the abdominal wall.

MECKEL'S DIVERTICULUM

JAMES A. JOHNSON, M.D.
Minneapolis, Minnesota

Meckel's diverticulum is an embryologic remnant of the omphalomesenteric duct. In 1812 Meckel first accurately described this condition, its embryological origin and the diseases to which it was subject. When the embryo is about five weeks old, the duct has no further function and normally disappears. Meckel's diverticulum is the most common form of embryologic remnant. There are, of course, several other forms which I shall not describe here but which I will illustrate by slides. Meckel's diverticulum is present in about 2 per cent of all persons and is said to have more potential danger than the appendix. Its dangers are chiefly mechanical and inflammatory. It is a chief causative factor in approximately 3 per cent of acute mechanical obstructions of the small bowel. It occasionally becomes inflammed like an appendix and because of its wide opening into the bowel it also becomes a lodging place for foreign bodies which occasionally perforate.

On December 7, 1922, I presented a paper before this society, describing the embryologic origin of Meckel's diverticulum and all of the various remnants of the omphalomesenteric duct. At that time I reported three cases in which Meckel's diverticulum caused intestinal obstruction. On August 30, 1925, I encountered another case of acute intestinal obstruction from a Meckel's diverticulum. This I reported about five years ago before the Minnesota Academy of Medicine.

I am reporting now the fifth case of Meckel's diverticulum causing acute intestinal obstruction. The purpose is to again call your attention to this condition.

John B., aged ten, was a normal boy who had always enjoyed good health, except for occasional transitory cramps. During the afternoon of September 3, 1942, he had attended the state fair and indulged considerably in candy, popcorn and soft drinks. That afternoon he had abdominal distress but slept most of the night. The following day in the late forenoon, he was suddenly seized with a severe pain in the right lower abdomen. He was seen by his family physician during the afternoon who at once recognized the seriousness of the condition and sent him to the hospital. When he entered the hospital he had no fever, his leukocyte count was 18,000 and the urine was normal. He was very tender over the appendix at which location a mass could clearly be felt. A diagnosis of acute appendicitis or a possible mechanical obstruction due to intussusception, was considered. Operation was advised and undertaken at once.

On opening the abdomen there was an intussusception of the lower part of the ileum into the ileum and this in turn had intussuscepted into the first part of the ascending colon. The intussusception was reduced with considerable difficulty. The bowel was in good condition. At about eighteen inches from the ileocecal valve there was a Meckel's diverticulum with a broad base and a separate mesentery. The diverticulum had inverted itself into the bowel and thus being caught in the peristaltic wave was responsible for the intussusception. The diverticulum was everted after the intussusception had been reduced. It was resected and the bowel was closed with catgut. The appendix was very long and distended, perhaps largely from pressure, and was, therefore, removed. There was a thin pus secretion in its tip. There was considerable free fluid in the abdomen which was aspirated. The abdomen was closed in layers in the usual manner without drainage. The postoperative course was uneventful and the boy left the hospital on the thirteenth day.

The Alaska salmon industry will produce this year, it is estimated, over 5,000,000 cases of packed salmon with a valuation more than seven times the amount paid Russia for Alaska in 1867.

* * *

Brazil is troubled with the problem of using 4,000,000 boxes of oranges which normally would go to Europe; free distribution at government expense to soldiers and school children solves it in part.

Minnesota Academy of Medicine

Meeting of April 14, 1943

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Minneapolis Club on Wednesday evening, April 14, 1943. Dinner was served at 7 o'clock and the meeting was called to order at 8:25 by the President, Dr. Harry B. Zimmermann.

There were forty-seven members and two guests present.

Minutes of the March meeting were read and approved.

The following men were elected as candidates for membership in the Academy: Dr. Thomas J. Kinsella, Minneapolis; Dr. Victor Hauser, Saint Paul; Dr. Donald C. Creevy, University; Dr. Leo G. Rigler, University.

The scientific program followed and consisted of one thesis.

CHANGES IN THE GASTRIC MUCOSA RELATED TO DISEASE

JAMES B. CAREY, M.D.

Minneapolis, Minnesota

Correct interpretation of changes in the gastric mucosa induced by various deleterious agencies must be based upon a thorough acquaintance with the appearance of the normal mucosa and knowledge of the effect upon it of manipulation incident to the examination and of physiologic activity and of nervous influences. The normal mucosa is glistening, orange red, smooth in the antrum and along the lesser curvature, but thrown into folds on the greater curvature and posterior wall. Contractions are ordinarily seen only in the antrum. Preliminary intubation for purposes of emptying the cavity may bruise the tops of the mucosal folds adjacent to the cardia, along the posterior wall and even, if the tube is forced too far, at the greater curvature. If suction has been forceful, through either large or small bore tubes, hemorrhagic blebs simulating mucosal lesions may be noted. Such traumatic hemorrhagic areas may be easily distinguished from the true sub-mucosal hemorrhages of inflammation by the experienced gastroscopist.

Air inflation of the stomach, necessary in order that the surfaces may be projected far enough away from the objective to be seen clearly, may flatten the smaller and narrower folds of the anterior wall, but seldom affects those of the greater curvature or posterior walls. Occasionally, air pressure sufficient to bring into view a few blood vessels above the angulus along the lesser curvature may be tolerated by the unanesthetized human patient. A few large blood vessels are normally seen in the fundus of the stomach. The gastric mucosa may be thinned in the anesthetized dog by air pressure to a degree that blood vessels are seen in all parts of the stomach. Even in dogs, however, the mucosa can never be stretched by inflation to an extent that it appears gray; some color always remains. It is not possible to mistake the effect of inflation for atrophy of the mucosa.

The stomach should, of course, be empty when examined, for obvious reasons. Experience with dogs leads to the opinion that the character of food habitually eaten by the patient may have something to do with the appearance of the gastric mucosa. That is to say, when dogs are fed the ordinary hospital scrap food, the gastric mucosa is engorged, or hyperemic, with an excessive amount of mucus and appears at times granular—a condition easily mistaken for a mild degree of superficial gastritis. For this reason, minor changes of this character are generally disregarded in examination of the human patient. Such changes are not observed in the dog's stomach when specially prepared dog food is used. Other criteria of gastritis must be present to warrant the diagnosis of actual gastritis.

We have not been able to identify with certainty changes arising from a disturbed mental state of the patient at the time of examination, other than excessive muscular activity, expressed as unusually powerful contractures of the antrum and pylorus or localized spasms in the body of the stomach. The vascular effects noted by Wolf and Wolff in the gastric mucosa of their human subject with a gastric fistula, in response to emotional stress, have not been uniformly observed in ordinary gastroscopic examinations. To be sure, some stomachs seem to be redder than normal, with more generous amounts of secretion, which phenomena are undoubtedly neurogenic, but investigation of the state of mind of each individual at the time of examination has not been attempted.

Atropine, together with codeine, is given subcutaneously to each patient before examination, for the purpose of diminishing the salivary flow. In the dog, atropine dries the mucosa within three minutes after injection of amounts from .009 to .062 mg. per kilo. The mucosa appears lusterless and granular, and the quantity of secretion is small. This effect gradually wears off. With this in mind, similar changes often noted in human patients have been ignored as implication of disease. The influence of atropine upon muscular activity of the gastric wall in anesthetized dogs is less constant. In some, atropine in amounts above 0.20 mg. per kilo, results in loss of tone as estimated by flattening of folds and greater tolerance for increments in air pressures. In the amounts given to unanesthetized patients, the effect of atropine is negligible.

Continuing the study of drug effects, Layne found that pilocarpin, in amounts of .048 to .47 mg. per kilo, increased secretion, caused hyperemia of the mucosa and increased gastric tone and peristalsis. Benzedrine sulfate, in amounts of .39 to 1.12 mg. per kilo, administered subcutaneously, produced mild hyperemia, slightly increased secretion but diminished tone.

The only dietary studies so far made have been with nicotinic acid. By feeding a Goldberger diet, black tongue was induced in dogs. Beyond a transient hyperemia of the mucosa, no other change was noted in the stomach. Pallor of the mucosa was noted correlative to the degree of anemia.

Acute gastritis may occur during an acute phase of infectious diseases as noted by Faber in children with diphtheria, meningitis and some of the exanthemata. Degeneration and ulceration of the gastric mucosa may accompany terminal stages of nephritis with uremia or of diabetes with acidosis. Chemical insult by strong acid or alkali solutions may cause hemorrhagic gastritis. Congestion and edema may follow ingestion of salicylates. All of these circumstances have been observed gastroscopically in isolated instances.

Large quantities of alcohol taken during a short period of time into an otherwise empty stomach produces at times acute hemorrhagic gastritis. We have seen several cases of the kind. Chronic alcoholism does not invariably produce gastritis. Gray and Schindler, and Berry have studied patients known to have consumed large quantities of alcohol over long periods of time. The incidence of gastritis was not greater than 45% in 100 individuals examined by Gray and Schindler. Berry found 35% of 100 alcoholics with mild superficial gastritis, 35% with definite chronic gastritis. None of these investigators was able to correlate the quantiy of alcohol consumed nor the duration of the addiction with the presence, kind or degree of gastritis.

Layne fed 4 dogs 75 c.c. of 20% alcohol every day for 906, 799, 394 and 336 days respectively. Within the first week or ten days generalized hyperemia of the mucosa was noted, which persisted for three to five weeks, then gradually subsided and finally entirely disappeared after about one hundred days. The mucosa thereafter remained normal in spite of continuous administration of alcohol.

Patients with pulmonary tuberculosis have been examined by Flexner and Baum, and by Hardt. No specific lesion was noted, the type of gastritis found being generally superficial or atrophic, a condition quite compatible with either a febrile or a dietary deficiency state. The gastric mucosa of patients with sprue was found to be generally atrophic by Olleros.

Unless directly invaded, the stomach of patients with syphilis is not appreciably affected by the disease. In 1938 Ylvisaker and I reported the first gastroscopic observation in the English literature of syphilis of the stomach of the linnitus plastica type. The walls of the stomach were thick and stiff, contracting the entire lumen and obliterating all usual landmarks and folds. After treatment the walls became flexible, folds and anatomical features were recognizable. A third examination, after cessation of treatment for six weeks, revealed an appearance similar to that observed at the first examination. Gummatous and ulcerative forms of gastric syphilis have been described.

Very few patients with gall-bladder disease have gastritis; at least, Howard, investigating cholecystectomized patients to determine the cause of residual symptoms, did not find gastritis often enough to account for the complaints. In a discussion of superficial atrophic gastritis, Barnett noted the occurrence of this form of gastritis in patients with the so-called mucous colitis syndrome. Submucosal hemorrhages were common in these patients.

Conditions seen in stomachs which have been operated upon in various ways have been described. When patients have persistent symptoms following gastroenterostomy or resection, gastritis, recurrent ulcer, stomal or jejunal ulcer are invariably discovered. It is possible that many such patients had gastritis before operation, a circumstance which emphasizes the necessity of pre-operative gastroscopic examinations.

The relation of gastritis and ulcer has still not been settled to the complete satisfaction of gastroscopist, surgeon and pathologist. The viewpoint of the gastroscopist, seeing the surface of the living mucosa with free circulation and intact nerve supply, is indubitably different from that of either the surgical pathologist, dealing with traumatized tissue, or of the autopsy pathologist examining dead, fixed tissue. The endoscopist must infer from the appearance of the surface of the mucosa the condition of the submucosal structures. The surgical pathologist must discount the effects of interference with blood supply by ligation of vessels and the traumatic results of clamping and manipulation of the stomach wall incident to operations. The anatomical pathologist must properly evaluate historical evidences of what may be unrelated inflammatory conditions and be resigned to the fact that the gastric mucosa is immediately affected by postmortem disintegration. The commonest lesion of the stomach, according to postmortem studies of Robertson, is submucosal hemorrhage. Such lesions may be the basis for ulcer, cancer or gastritis, but more often are not. Some European investigators have declared that gastritis is present as an antecedent condition in all stomachs subsequently the site of ulcer. Surgical experience in this country runs to the contrary opinion. The most carefully considered gastroscopic judgment is that the association of hypertrophic gastritis and peptic gastric ulcer is not invariable. In our own material, gastric ulcer is seldom accompanied by generalized hypertrophic gastritis. Duodenal ulcer and hypertrophic change in the gastric mucosa are much more commonly combined in the same patient. Hypertrophic gastritis with ulceration is a distinct condition; that is, an solated ulcerative lesion associated with generalized gastritis is not the same as a single round peptic ulcer. Hebbel found gastritis in the body of the stomach in 30 per cent of specimens examined from resected organs and gastritis of the antrum region in 100 per cent of specimens. The activity of the process or the relation to the extant ulcer was not always apparent. Ylvisaker and I found gastritis of the antrum in eleven of seventy patients with duodenal ulcer. The gastric mucosa was normal in sixteen patients with duodenal ulcer, about 23 per cent, a ratio comparable to the number of normal stomachs in the general gastroscopic population. Or, stated another way, the incidence of gastritis among patients with duodenal ulcer is about the same as among the generality of patients examined. The difference is that the gastritis associated with duodenal ulcer is of the hypertrophic or superficial type, never atrophic.

The conjunction of atrophic gastric mucosa, achlorhydria, and anemia of either hypochromic, microcytic type or hyperchromic, macrocytic type, with polypi and with cancer is constant enough to be more than coincidental. The atrophic condition observed in patients with achlorhydria and hypochromic or microcytic anemia appears to be of a degenerative character. In certain instances, the atrophy noted in patients with pernicious anemia, and invariably achlorhydria, has shown stigmata of inflammation. Polypi occur more often in the presence of an atrophic mucosa than when the mucosa is normal. Flat, benign adenofibromas are seen in the antrum in about 5 per cent of individuals with normal gastric mucosa. But papillomatous, pedunculated polypi occur more frequently with atrophic mucosa. Generalized polyposis is difficult to distinguish from extreme hypertrophy at times.

In a study of 233 patients with histamine refractive achlorhydria undertaken with Wetherby and Ylvisaker, 132 had atrophic mucosa, forty-four had superficial gastritis, thirty-four were normal, three showed hypertrophic changes and in twenty with extensive cancer, the details of the mucosa could not be made out. Twenty of the 132 patients had polypi. In the total number of gastroscopic examinations, the incidence of atrophy with polypi is about 2 per cent, atrophy with pernicious anemia about 3 per cent and atrophy with cancer about 10 per cent; atrophic gastritis has an incidence of about 12.5 per cent. Of twenty-three patients with pernicious anemia, all with achlorhydria and atrophy of the gastric musoca, three had polypi and two had cancer. It is known that some of these patients, with atrophy without pernicious anemia, had polypi which became malignant; in others cancers developed later in the course of the primary disease. Jenner has given his experience in Amsterdam as 4.42 per cent of cancer of the stomach in 181 patients with pernicious anemia. It seems fair to conclude that atrophic gastritis conditions the individual for either cancer or pernicious anemia or for both. Eusterman's experience with 1,014 patients with pernicious anemia was that 1.7 per cent had cancer. Even this figure, and certainly Jenner's higher one, is greater than the cancer expectancy for the general population. At any rate, patients with atrophic gastric mucosa, whether with pernicious anemia or not at the time, should be examined at frequent intervals. Certainly those with polypi should be kept under close observation.

The relation between hypertrophic gastritis and cancer is not as close as that between atrophy and carcinoma. But hypertrophic ulcerative gastritis particularly of the antrum and near the pylorus, may occasionally result in cancer. Judd's recent opinion is that carcinoma develops in a previously damaged stomach, that many years of persistent injury may be required before neoplastic transformation begins, and that pathogenesis of cancer is directly related to the disorganized hyperplasia of gastric mucous cells. It would seem, therefore, that repeated examinations of the gastric musoca are indicated in patients with hypertrophic mucosa, particularly of the antrum and if at any time ulcerative.

The inescapable conclusion of all gastroscopic studies is that patients with gastric symptoms should be examined endoscopically even if associated disease apparently explains the complaints referable to the stomach, and that all patients in whom a diagnosis of gastritis has been made, particularly atrophic gastritis, should be examined frequently in order that progress of events and occurrence of certain consequences may be recognized. Examination of patients for whom operation of the stomach has been decided will yield profitable data.

Discussion

Dr. R. G. Allison, Minneapolis: I should like to ask one question. In the case of achlorhydria, what percentage of those had gall-bladder disease? How many cases of achlorhydria were found with normal gall bladder and without pernicious anemia?

Dr. Carey, in closing: Hunter's questions, quoted by Dr. Wangensteen—Is the stomach a stewpan? Is it a vat? Is it a mixing mill?—have not yet been completely answered. The association, in pernicious anemia, of achlorhydria and intrinsic factor has not been established. Is the pyloric end of the stomach and some of the duodenum or the fundus implicated? Very few patients with total gastrectomy acquire true pernicious anemia. Anemia develops in some, but it is not a true pernicious anemia. Ivy was never able to cause pernicious anemia in totally gastrectomized pigs. In an ingenious set of experiments (confirmed by some one else whose name escapes me at the moment) Ivy fed livers from human patients who had died from gastric carcinoma to patients with pernicious anemia. The liver from the patient dying of pernicious anema, when fed to patients with pernicious anemia, did not cause maturation of the red cells or reticulocyte response. Livers from patients who had died with carcinoma of the body of the stomach contained a certain amount at least of the so-called intrinsic factor, capable of setting up the response we expect in the blood. Livers of patients who died of carcinoma of the pyloric end of the stomach, not involving the corpus, did not contain this specific factor.

In seven years of study of the gastric mucosa through the gastroscope, the association of superficial gastritis, atrophic gastritis, achlorhydria, pernicious anemia, cancer, and polypi, is of much greater importance than the so-called hypertrophic gastritis situation. There is a gastroscopic picture of what is called hypertrophic gastritis; its significance is still in doubt. I have not been able to associate it with any systemic disease except the ulcerative type of gastritis in the pyloric antrum which has a certain association with carcinoma. Gastritis of this region should be looked upon with more suspicion than that occurring in other parts of the stomach.

As for Dr. Allison's question about the association of achlorhydria, gall-bladder disease and gastritis. I think there is none. The achlorhydria that we have been attributing to the effects of cholecystitis may be functional. Certainly we do not find enough gastritis in patients with known and proved gall-bladder disease to explain any abberation in secretory mechanism.

In our studies of achlorhydria, Wetherby, Ylvisaker and I found 25 per cent of men with gall-bladder disease with no free HCl and 27.2 per cent of women; but, among patients without gastro-intestinal disease, 17.4 per cent of the men and 22.3 per cent of the women had no free hydrochloric acid.

The meeting adjourned.

E. V. Kenefick, M. D., *Secretary.*

Health and Accident Insurance Paying **Lifetime** *Benefits*



Non-Cancellable

Health and Accident Insurance—Paying from First Day

Special Policy for All Eligible Members of Minnesota State Medical Association

Lifetime benefits for both sickness and accident on a non-cancellable basis

- Pays benefits from FIRST DAY to LIFE for accidents and from FIRST DAY to LIFE for sickness.
- Carries full waiver of premium clause.
- Policy pays regardless of whether disability is immediate.
- Policy does not terminate at any age.
- Monthly benefits, $200.00; double indemnity, $400.00.
- Accident death benefits, $5,000.00; double indemnity, $10,000.00.
- Mutual Benefit is licensed in every state in the U.S.A.
- Additional benefits, $100.00 per month while in hospital.
- Additional benefits, $100.00 per month for nurses care.

We shall be glad to furnish further information

Minnesota Claim Office
410 McKnight Bldg.
Minneapolis, Minnesota

MUTUAL BENEFIT HEALTH AND ACCIDENT ASSOCIATION
OMAHA

Address:
Professional Group Department
410 McKnight Bldg.
Minneapolis, Minnesota

REPORT OF STATE DELEGATES TO HOUSE OF DELEGATES OF THE AMERICAN MEDICAL ASSOCIATION

Chicago, June 7, 8, 9, 1943

The 1943 session in Chicago of the American Medical Association showed 170 delegates present out of a possible 175, the only missing ones being those from Alaska, Philippines, Cuba, Puerto Rico and the Canal Zone.

Addresses were given by the President, President-Elect, Speaker of the House and various distinguished guests, including the Secretary of the Canadian Medical Association, General Kirk, Surgeon General of the Army, and General Grant, Chief of the American Aviation Medical Service.

The report of the Board of Trustees and Secretary showed the present membership as of April 1 at 123,000, of whom 45,000 are in the armed forces. The income for 1943 showed an increase over the previous year of $36,000 with reduced expenses of $7,000. The fellowship dues showed an increase of $9,000, advertising an increase of 26,000, investment income a decrease of $3,000, paper costs, salaries and wages an increase of $75,000, legal expense a reduction of $55,000.

There has been but slight reduction in the circulation of *The Journal.* The special journals are doing well, particularly that on "War Medicine." Due to the cost of paper *The Journal of the American Medical Association* will be a little thinner and the publication of foreign articles will be delayed.

Arrangements have been made for the continued flow of scientific articles for publication in spite of the scientific assembly not contributing papers this year. Press releases show continued growth. In 1942 there were 83,000 medical stories published and 3,800 inquiries answered.

The Bureau of Pharmacy and Chemistry has been in existence for thirty-eight years, the chemical laboratories for thirty-seven years. The Bureau on Physical Therapy made twenty-one reports on various subjects in 1942.

Prepayment medical plans are in force in twenty states and eight more have plans under serious consideration. Over 200 different schemes have been proposed. A few of the ten points emphasized in prepayment medical plans are:

1. There should be no third party involved in the relation of the patient and his physician.
2. Hospitals should not be permitted to practice medicine.
3. Radiology, anesthesia and laboratory procedures should be considered part of the practice of medicine.

Wisconsin delegates urged that state and county medical societies establish modified dues for men in service. This was not approved as so many men in service have already paid their dues and it was considered a matter for state regulations rather than for the AMA.

A bureau was established to outline and study existing schools for:

1. X-ray medical technicians.
2. Laboratory technicians.
3. Physical therapy technicians.
4. Occupational therapy technicians.
5. Medical record librarians.

Licensure in various states, including reciprocity, was considered to be within the jurisdiction of the various states and not a function of the AMA.

The principle of endorsing the study in high schools of hygiene and biology was recommended.

Indiana seemed to think that the public should have a representative in the House of Delegates but this did not meet with general approval.

Brig. General Grant of the Flight Service Medical Corps stated that last year there were ninety-seven Flight Surgeons. Today there are 9,300 and this Department has established the principle of special courses of study for this corps of medical men and 5,000 of them have already been designated to take such courses.

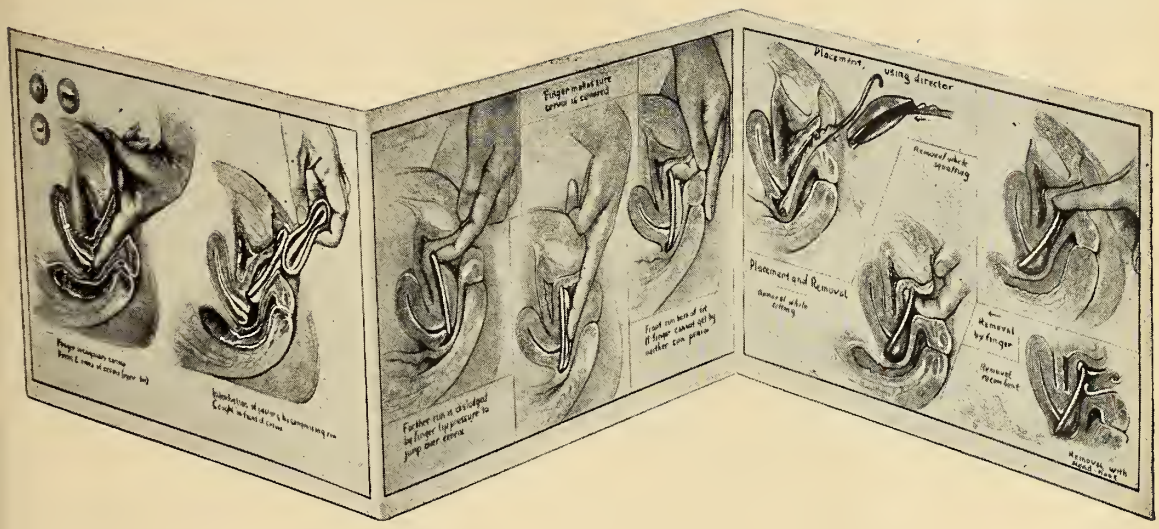
In 1942 a proposed amendment to the By-Laws was introduced in the House of Delegates to prevent some sixteen members of the House representing the various scientific sections from having a vote and only allowing them the privilege of the floor on subjects pertaining to their specialties. This proposed amendment was killed.

It was brought out that from twelve to fifteen million people in this country have provided themselves with hospitalization through prepayment plans. The AMA has made a study of the postwar medical program and a committee is to be set up having this function of postwar medical plans in hand.

New York introduced legislation which was unanimously adopted urging the appointment of a National Secretary of Health with the status of a cabinet member. This is but a repetition of seventy years of effort.

The outstanding discussion of the session centered over the medical service plan introduced by the Minnesota delegation according to instructions received

11th Edition Now Out *Send for Copy*



The Technique *of* Fitting Diaphragms

A series of charts in booklet form (6 x 9) clearly illustrating the technique of fitting diaphragms by the physician, now accompanied by the Dickinson-Freret Charts in two colors. For use by the physician in explaining the technique to his patient. These charts are regarded as the most helpful explanatory aid on the subject ever published. Eleventh edition now out. Write, or use coupon, for a copy.

Holland-Rantos
Company, Inc.
551 FIFTH AVENUE, NEW YORK, N. Y.

Holland-Rantos Co., Inc.
551 Fifth Avenue
New York, N. Y.

Without cost, please send your booklet on Fitting Technique to:

Dr.....

Street.....

City.....State.....

Red Label and Blue Label KARO are Interchangeable in Milk Modification

Both in chemical composition and in caloric value these two types of KARO are practically identical. There is only a difference in flavor.

Either is equally effective in milk modification. Your patients may safely use either type, if the other is temporarily unavailable at their grocers'.



How much KARO for Infant Formulas?

The amount of KARO prescribed is 6 to 8% of the total quantity of milk used in the formula—one ounce of KARO in the newborn's formula is gradually increased to two ounces at six months.

CORN PRODUCTS REFINING CO.
17 Battery Place • New York, N. Y.

from the House of Delegates of the Minnesota State Medical Association. Endorsing the same principle were the delegates from Oklahoma, District of Columbia, Wisconsin, Ohio, Nebraska, North and South Dakota, New Jersey and Iowa. Indication of the general interest in this matter was the presence of some 70 delegates and others at the session of the Reference Committee which considered the resolution.

This resolution was referred to the Committee on Legislation. The final action of the entire House of Delegates was a victory in principle for the effort. The House voted and the By-Laws were amended establishing a Council on Medical Service and Public Relations which will consist of the President, President-Elect, Secretary, a member of the Board of Trustees and six members of the AMA chosen according to geographical location.

The function of the Council is to work in conjunction with the Bureau of Legal Medicine of the AMA in informing state and county medical societies of pending national legislation affecting public health and in planning for medical care for all the people.

We of Minnesota hope that this new Council may function on a national scale somewhat as our analogous state committee functions in Minnesota.

W. A. Coventry, M.D.
A. W. Adson, M.D.
J. M. Hayes, M.D.
F. J. Savage, M.D.

AMERICAN CONGRESS OF PHYSICAL THERAPY

The American Congress of Physical Therapy will hold its twenty-second annual scientific and clinical session September 8, 9, 10 and 11, 1943, inclusive, at the Palmer House, Chicago. Rehabilitation is in the spotlight today—physical therapy plays an important part in this work.

The annual instruction course will be held from 8:00 to 10:30 a.m., and from 1:00 to 2:00 p.m. during the days of September 8, 9 and 10, and will include a round table discussion group from 9:00 to 10:30 a.m., Thursday, September 9. The scientific and clinical sessions will be given on the remaining portions of these days and evenings. A feature will be an hour demonstration showing technique from 5:00 to 6:00 p.m. during the days of September 8, 9 and 10. All of these sessions will be open to the members of the regular medical profession and their qualified aids.

For information concerning the instruction course and program of the convention proper, address the American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago, Illinois.

DEVELOP NEW DRESSING

Better first aid treatment for burns and wounds is promised by a new methalose gauze dressing developed by pharmacologists at Wayne University, Detroit. A soothing, healing water-soluble preparation, easily compounded and applied, are the advantages cited. Sulfanilamide and sulfathiazole are dissolved in propylene glycol, then added to a solution of alkyl cellulose.

WOMAN'S AUXILIARY

Mrs. Raymond J. Josewski, *President*
Stillwater, Minnesota
Mrs. W. H. Rucker, *Publicity Chairman*
Minneapolis, Minnesota

CONVENTION NEWS NOTES

Thirty members were present at the pre-convention board meeting which was held at the Curtis Hotel, Monday morning, May 17. All outstanding, unfinished issues were swiftly disposed of and county reports were saved for the annual meeting. A one o'clock luncheon concluded the session.

Three-thirty o'clock found our State Board members beautifully attired and waiting to greet all convention visitors at the tea Hennepin County Auxiliary had planned for them. Mrs. Frederick H. K. Schaaf of Minneapolis is to be commended on the very beautfiul tea she and her staff arranged in the Medical Arts Lounge.

The annual convention held Tuesday morning, May 18, at the Curtis Hotel, was very skillfully conducted by Mrs. Josewski. Reports from the various counties spoke well for the part doctors' wives are playing in both war and peace activities. The meeting closed with a farewell speech by Mrs. Josewski.

Officers elected for next year are:

President—Mrs. F. S. McKinney, Minneapolis
President-elect—Mrs. Anthony Bianco, Duluth
First Vice-President—Mrs. E. V. Goltz, St. Paul
Second Vice-President—Mrs. L. P. Howell, Rochester
Third Vice-President—Mrs. J. A. Thabes, Brainerd
Recording Secretary—Mrs. E. W. Miller, St. Peter
Corresponding Secretary—Mrs. L. D. Dack, St. Paul
Treasurer—Mrs. H. W. Quist, Minneapolis
Auditor—Mrs. R. V. Sherman, Red Wing
Historian—Mrs. George E. Penn, Mankato
Parliamentarian—Mrs. James S. Reynolds, Minneapolis

During the luncheon which followed the annual meeting Mrs. F. S. McKinney was welcomed to her position as president and responded with a few words of advice to the members on ways best to serve their auxiliary and the war effort.

As a finale to the meeting several members of Hennepin County Auxiliary returned to their childhood days, at least in dress, and sang and cavorted about under the guidance of Mrs. Harold Wahlquist as "the old woman who lived in a shoe" and Mrs. Horace Newhart as the wearer of the "Old Gray Bonnet."

The evening banquet at the Minikahda Club for the doctors and their ladies proved to be a delightful affair, highlights of which were the welcoming speech of Dr. Willard White, Mrs. McKinney's response to her introduction, and the informative talk by Dr. Walter Judd.

When all formalities are forgotten many of us will still remember that last conclave in the Medical Arts Lounge. The program's prosaic announcement "Coffee and Donuts" gave no clue of what was to follow. No one wanted to go home and did not until the afternoon wore on.

It was a good convention, we all declare. We'll see you next year in Rochester.

—Mrs. W. H. Rucker

SPENCER
Breast Supports
For Pre-Natal and Nursing



Spencer Maternity Support Spencer Nursing Support

Each Spencer Breast Support for pre-natal wear, like *all* Spencer Supports, is *individually designed* for the one patient who is to wear it, to lift and hold breasts in natural, healthful position, without compression.

It improves circulation—protects delicate inner tissues—helps prevent outer skin from stretching and breaking—aids breathing—improves appearance—encourages erect posture. Easily adjustable to increasing development.

Painful, engorged breasts are often relieved by a Spencer, as it allows veins to empty easily. (A further advantage is gained later in increased milk supply from equalization of circulation during pregnancy.)

Guards Against Caking and Abscessing

The Spencer Breast Support for nursing mothers provides protection against caking and abscessing. Closes in front for nursing convenience.

Spencer Supports are never sold in stores. For a Spencer Specialist, look in telephone book under "Spencer Corsetiere" or write direct to us.

SPENCER *INDIVIDUALLY DESIGNED*
Abdominal, Back and Breast Supports

SPENCER INCORPORATED,
137 Derby Ave., New Haven, Conn.
In Canada: Rock Island, Quebec.
In England: Spencer (Banbury) Ltd., Banbury, Oxon.

May We Send You Booklet?

Please send me baaklet, "Haw Spencer Supports Aid the Doctar's Treatment."

.....M. D.
Address .....

Of General Interest

Dr. R. P. Hallin of Minneapolis became associated with the Worthington Clinic July 1.

* * *

Dr. and Mrs. A. L. Pertl of Canby are the parents of a daughter, Marion Alice, born March 27, 1943.

* * *

Dr. T. O. Wellner has disposed of his practice at Anoka and is now practicing in Rochester, Minnesota.

* * *

Dr. E. R. Addy of Gilbert, who is now in the military service in Anchorage, Alaska, has been made Post Surgeon of the army camp near Anchorage, with the commission of Captain.

* * *

Dr. Virgil Lundquist, who received his degree of Doctor of Medicine at the University of Minnesota on March 18, is now stationed at Camp Farragut, Idaho, in the medical corps.

* * *

Dr. J. R. Lenz, who has an established medical practice in Morton, is extending his practice to include three mornings a week in Fairfax. He will continue his regular practice at Morton.

Dr. Theodor Bratrud of Minneapolis received the Marquette University alumni award in May for his paper on "Adrenal Hyperptosis" submitted at an alumni clinic of the medical school in Milwaukee.

* * *

Dr. O. K. Behr of Crookston has purchased the medical practice of Dr. G. W. Bohl at Ada and will devote three afternoons a week to the practice in Ada for the present. He is a member of the Crookston Clinic and will maintain his connection with the clinic.

* * *

At the June meeting of the Minnesota Society of Internal Medicine Dr. Thomas Lowry of Minneapolis and Dr. Emmett E. Kenefick of Saint Paul were elected members of the society. The next meeting will be held at Saint Paul in the fall.

* * *

Dr. E. L. Stephan of Hinckley, recently completed fifty years of practice as a physician and surgeon in the same community. He was among those honored at the recent State Association meeting as a new member of the Fifty Club.

* * *

Dr. John G. Lohmann of Jasper has purchased the practice of Dr. E. F. McElmeel at Pipestone and will



HER YEARS of usefulness extended . . . days, weeks and months restored to her that might have passed clouded with pain or distracting mental symptoms—her energies spent in the menopausal disturbances. Indeed a timely conservation of human powers!—accomplished through the judicious use of estrogenic substances....

The man who administers the treatment may reach with confidence for the estrogenic preparation of the Smith-Dorsey Laboratories—capably staffed as they are... equipped to the most modern specifications . . . geared to the production of a strictly standardized medicinal.

You will approve the quality of this Council-accepted Solution of Estrogenic Substances, Smith-Dorsey.

Supplied in the following dosage forms:

1 cc. Amp. 2,000 units per cc.
1 cc. Amp. 5,000 units per cc.
1 cc. Amp. 10,000 units per cc.
10 cc. Amp. Vials 5,000 units per cc.
10 cc. Amp. Vials 10,000 units per cc.
10 cc. Amp. Vials 20,000 units per cc.

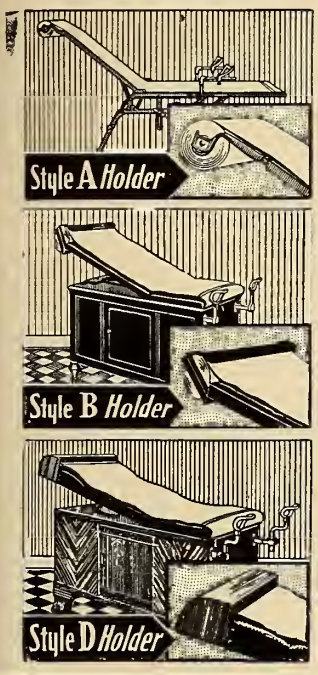


The SMITH-DORSEY COMPANY LINCOLN NEBRASKA

Manufacturers of Pharmaceuticals to the Medical Profession since 1908

SOLAREUM

SANITARY PAPER TABLE SHEETING



The Answer to Your Laundry Problem

A clean sheet for every patient, always ready, always available, at a fraction of the laundering cost of a cloth sheet.

Solareum sheeting is a very soft but very tough white creped paper, especially made to replace cloth sheets. Available in 18", 20" and 24" widths. Holders for all types of tables.

Your Distributor

C. F. ANDERSON CO., INC.

9th and Marquette Minneapolis Atlantic 3229

move there this month. Dr. McElmeel has entered a three-year fellowship of study in ear, nose and throat diseases in Minneapolis.

* * *

Dr. R. C. Farrish, Sherburn, Dr. R. L. Parsons, Monterey, and Dr. I. Fisher, Ceylon, were recently appointed to serve as examining physicians on the draft board of Martin County, to supplement the services of the draft board located in Fairmont.

* * *

The honorary degree of Doctor of Science was conferred upon Dr. H. F. Helmholz of Rochester by the University of Wisconsin at its ninetieth Commencement this year. Dr. Helmholz is a graduate of the University of Wisconsin.

* * *

Dr. Carl Peterson, who was attending physician of the Minneapolis Symphony Orchestra on tour for two years, has opened offices for the practice of medicine at Chisago City. Dr. Peterson is taking over the practice of Dr. Lorin Olson, who is now in service.

* * *

Dr. Wesley W. Spink, professor of medicine at the University of Minnesota School of Medicine, has left for Guatamala for a month's intensive study, in a United Fruit Company hospital, of the clinical and public health aspects of tropical diseases.

Dr. E. I. Parson, who has been surgical assistant to Dr. C. H. Mead of Duluth since January 5, 1942, has been commissioned as First Lieutenant in the Army Air Forces of the United States and reported June 30 to Carlisle Barracks, Pennsylvania, for active service.

* * *

Dr. William R. Bagley has been appointed as a member of the St. Louis County Sanatorium Commission to fill out the unexpired term of Dr. Samuel H. Boyer, Jr., who resigned to enter military service. The new term is for three years.

* * *

Dr. Charles E. Rea and Dr. William C. Bernstein, of the University Hospitals staff, left July 1 for Knoxville, Tennessee, where they will be engaged in a war department project, the exact nature of which is a military secret.

* * *

Dr. J. H. Vogel of New Ulm completed forty years of service as a physician in New Ulm on June 19, 1943, having offices in the building occupying the same site as the one in which he started practice in 1903. Following World War I Dr. Vogel became associated with Dr. O. J. Seifert, a partnership which has continued to the present time.

Fifty years ago in June, Dr. W. M. Dodge of Farmington began the practice of medicine in partnership with his father, Dr. Levi Parker Dodge, and has continued to serve the same community during the intervening years. Medicine has been a family profession for several generations. Dr. W. M. Dodge, Jr., who has practiced as an eye and ear specialist in Battle Creek, Michigan, is now serving as a Major in the Army.

* * *

Dr. G. A. Hedberg has been appointed superintendent of Nopeming Sanatorium, succeeding Dr. A. T. Laird who has been superintendent of the sanatorium since its inception in 1912. Dr. Hedberg has been a member of the sanatorium medical staff since 1931 and in recent years has served as assistant medical director. Dr. Laird, who is retiring from active practice, will make his home in Duluth.

* * *

Dr. W. E. Macklin of Litchfield has been commissioned a Lieutenant Commander in the Navy and is now stationed at the Great Lakes Naval Training Station, where he reported for duty June 28. Dr. Macklin is the fourth in his immediate family to enter the service. Two sons, William E., Jr., and John are serving as lieutenants in the Army and Navy, respectively, and a daughter, Mary, started active duty as a member of the WAC in June.

NOTICE: The formulæ of the U. S. Pharmacopœia XII for the following preparations have been revised due to the scarcity of glycerin:

Syrupus Ipecacuanhæ is now officially made with the fluidextract of ipecac and syrup, the glycerin being omitted.

Tinctura Gentianæ Composita is made by using diluted alcohol without glycerin as the menstruum.

Tinctura Opii Camphorata (paregoric) is made by the addition of one-quarter of the amount of glycerin formerly used in the solvent.

BLONDS CRACK IN TROPICS

The average white man is not "geared to the tropics," and blonds are especially likely to crack, Lieut. Comdr. James L. McCartney declared. Of twelve cases he described, of men invalided back to the United States from the tropics in the present war, all with diagnosis of nervous and mental sickness, all were blonds.

They had headaches, scary dreams, low blood pressures, were easily tired, depressed, restless, had hallucinations and lapses of memory.

Why blonds are less able to stand the tropics was not explained but it may be because their skins are less able to withstand the intense sunlight. Comdr. McCartney quoted another scientist who had observed the effects of the tropics before the war and wrote that "tropical irritability is mostly due to the constant bombardment of the sun, for it is worse in blonds."—*Science News Letter*, May 22, 1943.

Radiation Therapy Institute



Treatment Room

of Saint Paul

CHARLES T. MILLER HOSPITAL

Facilities for Radium and Roentgen Therapy, Including Million Volt Constant Potential Installation of Most Advanced Design.

You are cordially invited to visit the Radiation Therapy Institute and inspect its facilities

Edward Schons, M.D., *Director* J. P. Medelman, M.D., *Associate Director*

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

ATLAS OF OBSTETRIC TECHNIC. Paul Titus, M.D., Obstetrician and Gynecologist to St. Margaret Memorial Hospital, Pittsburgh, Secretary, American Board of Obstetrics and Gynecology. 180 pages. Illus. Price, $7.00, cloth. St. Louis: C. V. Mosby Co., 1943.

A HANDBOOK OF MEDICAL LIBRARY PRACTICE. Janet Doe, Editor. Compiled by a Committee of the Medical Library Association. Based on a preliminary manuscript by M. Irene Jones. 609 pages. Price, $5.00, cloth. Chicago: American Library Association, 1943.

GUIDE TO PRACTICAL NUTRITION. Michael G. Wohl, M.D., and John H. Willard, M.D., editors. Introduction by Morris Fishbein, M.D. 98 pages. Philadelphia County Medical Society, 1943.

PICTORIAL HANDBOOK OF FRACTURE TREATMENT. Edward L. Compere, M.D., F.A.C.S. Associated Professor of Surgery, Northwestern University Medical School, Chairman Department of Orthopædic Surgery, Wesley Memorial Hospital; Consulting Orthopædic Surgeon, Chicago Memorial Hospital; and Sam. W. Banks, M.D., Associate in Surgery, Northwestern University Medical School, Attending Orthopædic Surgeon, Chicago Memorial Hospital. 351 pages. Illus. Price $4.25. Chicago: Year Book Publishers, 1943.

THE PRINCIPLES AND PRACTICE OF WAR SURGERY. J. Trueta, M.D., formerly Surgeon of General Hospital of Catalonia, University of Barcelona; Assistant Surgeon, Wingfield-Morris Orthopædic Hospital, Oxford; Acting Surgeon-in-Charge, Accident Service Radcliff Infirmary, Oxford. 441 pages. Illus. Price $6.50. St. Louis: C. V. Mosby Co., 1943.

One is attracted to this work by the generous acknowledgment of the author in his preface to the sources of the ideas that he has combined to make practical the treatments he advocates.

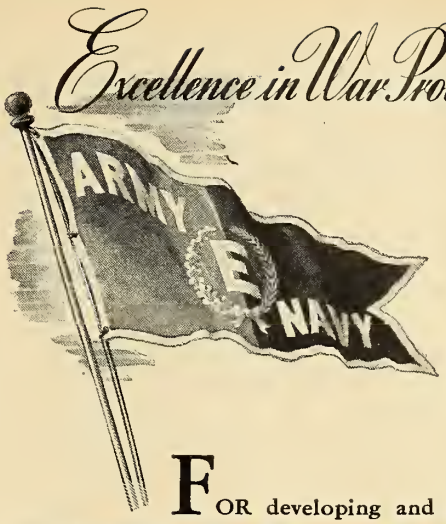
His wide experience in war emergency surgery with a resulting treatment both practical and scientific is of great importance at this time.

The handling of wounds—compound fractures—regional surgery—shock—infection—treatment of burns—varicose ulcers—skin grafting—are based on wide experience and come more nearly providing a concise outline for routine procedure than any treatise we have seen.

His application and technique in the use of plaster-of-Paris simplifies and facilitates the care and recovery of many cases that are being handled in more complicated and possibly a less effective way.

This 400-page book should be read by every general practitioner and surgeon. It is highly informative. In these days of war and our great industrial activity with an increasing limitation of professional care to an increasing civil population each physician must prepare himself for emergencies where he will be the only specialist.

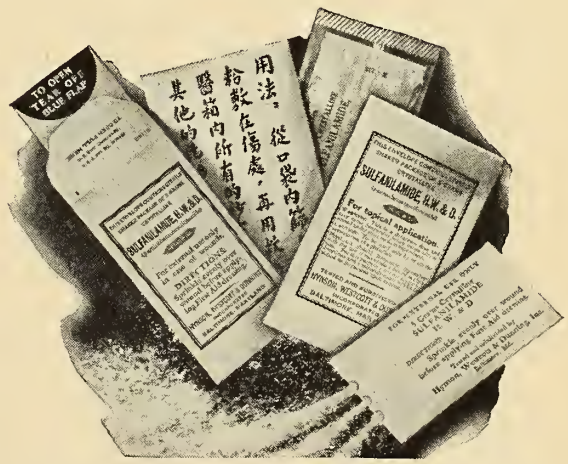
WM. R. BAGLEY, M.D.



FOR developing and producing Sterile Shaker Packages of Crystalline Sulfanilamide especially designed to meet military needs, for supplying Mercurochrome and other drugs, diagnostic solutions and testing equipment required by the Armed Forces, and for completing deliveries ahead of contract schedule—these are the reasons for the Army-Navy "E" Award to our organization.

Until recently our total output of Sterile Shaker Packages of Crystalline Sulfanilamide was needed for military purposes. As a result of increased production, however, we can now supply these packages for civilian medical use. The package is available only by or on the prescription of a physician.

Supplied in cartons of one dozen Shaker Packages each containing 5 grams of Sterile Crystalline Sulfanilamide, 30-80 mesh.



HYNSON, WESTCOTT & DUNNING, INC.
BALTIMORE, MARYLAND

PROFESSIONAL PROTECTION

SINCE 1899
SPECIALIZED
SERVICE

In addition to our Professional Liability Policy for private practice we issue a special

MILITARY POLICY

to the profession in the Armed Forces at a

REDUCED PREMIUM

THE

MEDICAL PROTECTIVE COMPANY

OF

FORT WAYNE, INDIANA

Cook County Graduate School of Medicine

(In Affiliation with Cook County Hospital)

Incorporated not for profit

ANNOUNCES CONTINUOUS COURSES

SURGERY—Two Weeks' Intensive Course in Surgical Technique starting July 26, August 9, August 23, and every two weeks throughout the year.

MEDICINE—Two Weeks' Intensive Course starting October 4. Two Weeks' Course in Gastro-enterology starting October 18. Two Weeks' Course in Electro-cardiography starting August 2.

FRACTURES & TRAUMATIC SURGERY—Two Weeks' Intensive Course starting October 18.

GYNECOLOGY—Two Weeks' Intensive Course starting October 18. One Month Personal Course starting August 2. Clinical and Diagnostic Courses.

OBSTETRICS—Two Weeks' Intensive Course starting October 4.

OPHTHALMOLOGY—Two Weeks' Intensive Course starting September 27. Course in Refraction Methods, October 11.

OTOLARYNGOLOGY—Two Weeks' Intensive Course starting September 13.

ROENTGENOLOGY—Courses in X-ray Interpretation, Fluoroscopy, Deep X-ray Therapy every week.

UROLOGY—Two Weeks' Course and One-month Course available every two weeks.

CYSTOSCOPY—Ten-Day Practical Course every two weeks.

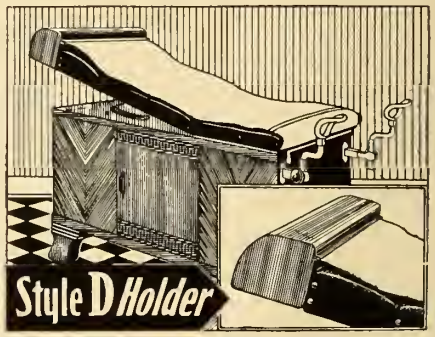
General, Intensive and Special Courses in All Branches of Medicine, Surgery and the Specialties.

TEACHING FACULTY — ATTENDING STAFF OF COOK COUNTY HOSPITAL

Address: Registrar, 427 S. Honore St., Chicago, Ill.

SOLAREUM

PAPER TABLE SHEETING



An immaculate white paper especially made for the doctor's examining table makes no crackling noise, will not break or tear, is soft, clothlike, and comfortable.

The convenient paper roll holder provides a continuous supply of SOLAREUM sheeting and adds a touch of sanitary efficiency to the physician's office.

BROWN & DAY, INC.

St. Paul, Minnesota

PHYSICIANS CASUALTY ASSOCIATION
PHYSICIANS HEALTH ASSOCIATION

ACCIDENT HOSPITAL SICKNESS

INSURANCE

OMAHA OMAHA

For Ethical Practitioners Exclusively

(57,000 POLICIES IN FORCE)

$5,000.00 accidental death $25.00 weekly indemnity, accident and sickness	For **$32.00** per year
$10,000.00 accidental death ..... $50.00 weekly, indemnity, accident and sickness	For **$64 00** per year
$15,000.00 accidental death $75.00 weekly indemnity, accident and sickness	For **$96.00** per year

ALSO HOSPITAL EXPENSE FOR MEMBERS, WIVES AND CHILDREN

41 years under the same management

OVER $2,418,000 INVESTED ASSETS
OVER $11,350,000 PAID FOR CLAIMS

$200,000 deposited with State of Nebraska for protection of our members

"86 CENTS OF EACH $1.00 OF GROSS INCOME IS USED FOR MEMBERS' BENEFITS"

Send for application, Doctor, to
400 FIRST NATIONAL BANK BLDG., OMAHA, NEB.

(Continued from Page 650)

er. In the nonemergency case, the very nature of the illness insures several days' time for ample investigation to determine eligibility for medical care at township or county cost before authorization is issued. In the emergency case, notification of the proper authority by the physician rendering such service should be followed within a few days by an investigation of the eligibility of the patient for such service at taxpayer cost. When it has been determined by the social service worker, as the result of proper investigation, that the township or county is legally responsible for the bill for medical services of a nonemergency nature, written authorization is issued to the physician. And after notification of the performance of emergency medical or surgical services, the bill for such services should be approved as soon as proper social service investigation determines the eligibility of the patient for such services at taxpayer cost. Even when the bill is so approved, it is usually not paid until after the next meeting of either the county welfare board or the board of county commissioners.

These few points are the ones of greatest controversy between physicians and welfare or township and county authorities when bills for medical services to paupers or indigents are involved. It is sincerely hoped that this letter will provide a better understanding of some of the technicalities and thus lead to greater harmony between those who provide medical care to indigents and those who pay for such services.

Yours very truly,

EDWIN J. SIMONS, M.D.,
Chief Medical Unit Division of Social Welfare.

. . . . water without minerals is like food without salt

TASTE

GLENWOOD
INGLEWOOD
NATURAL*
SPRING WATER

for home and office



GENEVA 4351

Naturally Mineralized, Naturally Healthful

CLASSIFIED ADVERTISING

WANTED—Physician licensed to practice in Minnesota. Address inquiries to Dr. Edwin J. Simon, Medical Services Unit, Division of Social Welfare, 610 Globe Building, Saint Paul, Minnesota.

* * *

FOR RENT—Doctor's office in Faust Building, Saint Paul. Ideal location for branch office. Dentist now using half of building. Inquire at 626 University Avenue, Saint Paul, or telephone ELkhurst 6058.

SCIENTIFIC DESIGN

ARTIFICIAL LIMBS
ORTHOPEDIC APPLIANCES
TRUSSES
SUPPORTERS
ELASTIC HOSIERY

Our mechanics correctly fit artificial limbs and orthopedic appliances, conforming to the most exacting professional specifications.

Our high type of service has been accepted by physicians and surgeons for more than 45 years, and is appreciated by their patients.

BUCHSTEIN-MEDCALF CO.
610 Third Ave. So. Minneapolis, Minn.

DANIELSON MEDICAL ARTS PHARMACY, INC.

PHONES:
ATLANTIC 3317
ATLANTIC 3318

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

HOURS:
WEEK DAYS—8 to 7
SUN. AND HOL.—10 TO 1

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.
414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.
INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS
MAIN 2494



VOCATIONAL HOSPITAL

. . . An integral part of the Miller Vocational High School offers two special features—Patients receive a maximum of personal attention from student practical nurses—All food is prepared under the direction of a qualified dietitian. Patients remain under the care of their own physicians.

Director of Nurses—M. H. WOLTMAN, R.N., B.S.
Superintendent & Dietitian—H. B. BROWN, B.S.

Physicians may secure services of Vocational nurses by calling Nurses Headquarters and asking for a Vocational Nurse

Bridgeport 2281

5511 South Lyndale - - Minneapolis



The Birches Sanitarium, Inc.

2391 Woodland Avenue

Duluth, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Psychiatrists in Charge

L. R. Gowan, M.D. **A. S. Nissen, M.D.**

Social and Educational Adjustment

for exceptional children of all ages. Visit the school noted for its work in educational development and fitting such children for more normal living. Beautiful grounds. Home atmosphere. Separate buildings for boys and girls.

Catalog by request.

The MARY E. POGUE SCHOOL

124 GENEVA ROAD WHEATON, ILL.
(NEAR CHICAGO)

Complete Optical Service

LENS GRINDING
DISPENSING
CONTACT LENSES
EYE PHOTOGRAPHY

N. P. Benson Optical Co., Inc.

Established 1913

Main Office: Minneapolis, Minn.

— BRANCHES —

Aberdeen - Duluth - Eau Claire - Winona
Bismarck - La Crosse - Wausau - Stevens Point
Albert Lea - Rapid City

For Victory

Buy War Bonds and Stamps

Zemmer

PRESCRIBE or DISPENSE ZEMMER PHARMACEUTICALS

Tablets, Lozenges, Ampoules, Capsules, Ointments, etc. Guaranteed reliable potency. Our products are laboratory controlled. Write for catalogue.

Chemists to the Medical Profession

THE ZEMMER COMPANY • OAKLAND STATION • PITTSBURGH, PENNSYLVANIA

MIN 7-43

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.

414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.

INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS

MAIN 2494

SAVE TIME!
TRY DAHL'S FIRST

Biologicals
Pharmaceuticals
Hypodermic Medications
Dressings
Surgical Instruments
Trusses

7:30 a.m. to 11 p.m.
Holidays, 9 a.m. to 11 p.m.

Joseph E. Dahl Co.

Incorporated

ATlantic 5445 — 82 So. 9th St., Mpls.

Radiological and Clinical

Assistance to Physicians
in this territory

MURPHY LABORATORIES

Minneapolis: 612 Wesley Temple Bldg. - - At. 4786
St. Paul: 348 Hamm Bldg. - - - - - - - Ce. 7125
If no answer, call - - - - - - - - - - Ne. 1291



Largest Orthopedic Manufacturers in the Northwest

SPECIALISTS!

Extension Shoes and Clubfoot Corrections . . . Abdominal and Arch Supports . . . Braces for Deformities . . . Elastic Stockings . . . Expert Truss Fitters . . .

•

Seelert Orthopedic Appliance Company

88 South 9th Street
Minneapolis — MAin 1768

Hall & Anderson

PRESCRIPTION PHARMACY
BIOLOGICALS
PHYSICIANS' SUPPLIES

SAINT PAUL, MINN.

LOWRY MEDICAL ARTS BUILDING
TELEPHONE: CEDAR 2735

BUY WAR BONDS

★ V ★ V — V ★ V ★

If you have on hand, or contemplate having, surplus funds, BUY WAR BONDS.

If you wish to retain a portion in cash, deposit that amount in our SAVINGS DEPARTMENT.

Interest paid quarterly.

THE AMERICAN NATIONAL BANK

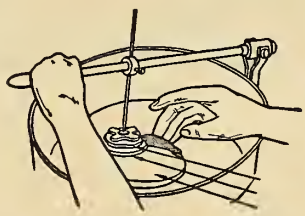
BREMER ARCADE
7TH AT ROBERT

V

Member Federal Deposit Insurance Corporation

Cedar 0573

UNUSUAL LENS GRINDING



CATARACT, MYO-THIN and other difficult and complicated lenses are ground to extreme thinness and accuracy by our expert workmen.

ARTHUR F. WILLIAMS

SAINT PAUL
MINNESOTA

Save 25 to 40 Per Cent

Druggists' Mutual Insurance Company

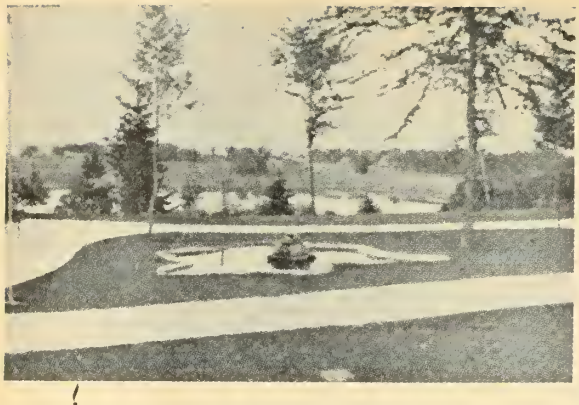
OF IOWA, ALGONA, IOWA

Fire - Tornado - Automobile Insurance

Prompt Loss Service

Minneapolis Branch—S. E. STRUBLE, 835 Palace Bldg.

Home Office—Algona, Iowa



One of the views

Glenwood Hills Hospitals

3501 Golden Valley Road
Hyland Station
Route Seven

Operated In Connection with Homewood Hospital

Plymouth at Penn Avenue, Minneapolis

FOR THE TREATMENT OF NON-SURGICAL AND NON-INFECTIOUS DISEASES

A modern hospital built on the cottage plan. The buildings are located on elevated land, affording beautiful views on all sides. Glenwood Hills Hospitals have all the advantages of rural surroundings, and are still only a few minutes by automobile from the Minneapolis loop.

AN INVITATION

The facilities of these institutions are available for all reputable members of the medical profession.

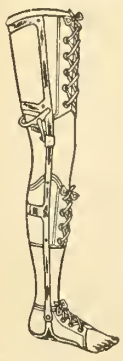


HOMEWOOD HOSPITAL is one of the Northwest's outstanding hospitals for the treatment of Nervous Disorders—equipped with all the essentials for rendering high grade service to patient and physician.

Operated in Connection with Glenwood Hills Hospitals

HOMEWOOD HOSPITAL

Corner Penn and Plymouth Avenues North
Minneapolis Minnesota



Orthopedic Braces and Appliances

Physicians' specifications followed precisely.
Scientific manufacture and fitting.

AUGUST F. KROLL

Manufacturer
230 WEST KELLOGG BLVD.
St. Paul, Minn. CE. 5330

Send us your slow collection items.
All accounts made by personal calls.
We specialize in Medical and Dental Accounts.

Bonded and Licensed Under Minnesota State Laws

Northwestern Adjustment Co.

518 Bremer Arcade Bldg.
St. Paul Minnesota

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 **August, 1943** **No. 8**

Contents

Compression Fractures of the Spine
C. Curry Bell, M.D., Saint Paul, Minnesota..... 687

Intertrochanteric Fractures.
Myron O. Henry, M.D., Minneapolis, Minnesota.. 690

Ununited Fractures.
Melvin S. Henderson, M.D., Rochester, Minnesota 692

Fratures of Lower End of Radius and Ulna.
C. C. Chatterton, M.D., Saint Paul, Minnesota.. 697

Pathologic Changes in the Auricles in Auricular Fibrillation Associated With Hypertension.
Lee Stover, M.D., and *Thomas J. Dry, M.D.,* Rochester, Minnesota 699

Management of Industrial Injuries.
Henry W. Meyerding, M.D., Rochester, Minnesota 705

A Deodorant for Colostomies.
W. C. Carroll, M.D., Saint Paul, Minnesota..... 709

Trauma of the Spleen.
John M. Culligan, M.D., and *D. Jack Soltman, M.D.,* Saint Paul, Minnesota..... 710

Clinical-Pathological Conference.
Presentation of a Case.
A. J. Hertzog, M.D., and *S. V. Lofsness, M.D.* 714

Case Report:

Rocky Mountain Spotted Fever.
H. R. Tregilgas, M.D., South Saint Paul, Minnesota 715

History of Medicine in Minnesota:
History of Medicine in Dodge County. (Continued from July issue.)
James Eckman, Rochester, and *Charles E. Bigelow, M.D.,* Dodge Center, Minnesota..... 718

President's Letter:
An Open Letter to Dr. Fishbein.....724

Editorial:

Maternity and Infant Care for Wives and Sick Infants of Enlisted Men.....725

The Wagner-Murray Bill..... 725

Additional Food for Patients..... 726

Medical Economics:

The New Council on Medical Services: Its Duties and Powers..... 728

An Unwarranted Attack..... 731

Congressional Conference 731

Industrial Health:

Industrial Physicians Are Needed..... 732

Minneapolis Surgical Society:

Meeting of March 4, 1943..... 733

Seed Implantation Skin Grafts.
H. O. McPheeters, M.D., Minneapolis, Minnesota 733

Ganglia of the Joint Capsules and Tendon Sheaths.
Harvey Nelson, M.D., Minneapolis, Minnesota.. 734

Unusually Severe Facial Injury.
Kenneth Bulkley, M.D., Minneapolis, Minnesota 737

In Memoriam..... 739

Reports and Announcements..... 742

Of General Interest..... 745

Book Reviews..... 749

Contents of Minnesota Medicine copyrighted by Minnesota State Medical Association, 1943

Entered at the Post Office in Minneapolis as second class mail matter. Accepted for mailing at the special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 13, 1918.

MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL ASSOCIATION

Published by the Association under the direction of its Editing and Publishing Committee

EDITING AND PUBLISHING COMMITTEE

E. M. HAMMES, Saint Paul
PHILIP F. DONOHUE, Saint Paul
H. W. MEYERDING, Rochester
H. A. ROUST, Montevideo
B. O. MORK, JR., Worthington
A. H. WELLS, Duluth
O. W. ROWE, Duluth
T. A. PEPPARD, Minneapolis
HENRY L. ULRICH, Minneapolis
C. L. OPPEGAARD, Crookston

EDITORIAL STAFF

CARL B. DRAKE, Saint Paul, Editor
GEORGE EARL, Saint Paul, Associate Editor
HENRY L. ULRICH, Minneapolis, Associate Editor

BUSINESS MANAGER

J. R. BRUCE

Annual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian Subscriptions—$3.50.

The right is reserved to reject material submitted for editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

Classified advertising—five cents a word; minimum charge, $1.00. Remittance should accompany order.

Display advertising rates on request.

Address all communications to Minnesota Medicine, 2642 University Avenue, Saint Paul, or National Bldg., Minneapolis. Telephone Nestor 2641.

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN



MAIN BUILDING—ONE OF THE 5 UNITS IN "COTTAGE PLAN"

A Modern Private Sanitarium for the Diagnosis, Care and Treatment of Nervous, Mental and Medical Cases

Located on beautiful Lake St. Croix, eighteen miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Milk, cream and butter from our own herd of Tuberculin-tested Registered Guernsey Cows. Inspection and coöperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

CONSULTING NEURO-PSYCHIATRISTS

Hewitt B. Hannah, M.D.
Joel C. Hultkrans, M.D.
511 Medical Arts Building
Minneapolis, Minnesota
Tel. MAin 4672

RESIDENT PHYSICIAN
Howard J. Laney, M.D.
Prescott, Wisconsin
Tel. 39

SUPERINTENDENT
Ella M. Mackie
Prescott, Wisconsin
Tel. 69



* With men in the Army, the Navy, the Marine Corps, and the Coast Guard, the favorite cigarette is Camel. (Based on actual sales records in Post Exchanges and Canteens.)

BUY WAR BONDS AND STAMPS

SO EASY TO GIVE

the wanted gift!

Cigarettes—the Gift that Rates with Service Men...Camel—the Brand that Rates First...

It's the thought behind your gift that's important to men in the armed forces. Meaning that sending Camel Cigarettes is the really considerate way to express your generous impulse.

First, cigarettes are highly prized by fighting men. Second, Camel is the brand prized above all others*—for sheer mildness, cheering fragrance, delightful flavor.

Let a carton of Camels convey your hearty good-will to friend or relative in service. Your dealer features Camels in cartons. See or telephone him today.

New reprints available on cigarette research—Archives of Otolaryngology, February, 1943, pp. 169-173—March, 1943, pp. 404-410. Camel Cigarettes, Medical Relations Division, 1 Pershing Square, New York 17, N. Y.

Camel

COSTLIER TOBACCOS



SHE SWAPPED GLAMOUR FOR GUNS

... but she's still a woman

HER SON is in the infantry—and she knows that he can get the "job" done quicker and be home sooner if materiel is not lacking. Hence, swapping glamour for guns she takes her place in the war effort. But she has a private fight. She's at the age when she wonders if she can keep fit—physically as well as emotionally.

Clinical records show that today loss of time because of menopausal distress is largely unnecessary. Such symptoms can be relieved by adequate therapy with natural or synthetic estrogens.

Both Amniotin (natural estrogenic substance) and Diethylstilbestrol Squibb (synthetic estrogen) are available in dosage forms for oral and hypodermic administration. Diethylstilbestrol is lower in cost and, in contrast to natural estrogens, is only slightly less effective orally than intramuscularly. However, its high potency necessitates cautious use and indicates the advisability, in some instances, of building up the estrogenic level with Amniotin by injection and then, of maintaining therapy with small oral doses of Diethylstilbestrol.

SQUIBB
ESTROGENIC SUBSTANCES

AMNIOTIN . . . A highly purified, non-crystalline preparation of naturally occurring estrogenic substances derived from pregnant equine urine. Its estrogenic activity is expressed in terms of the equivalent of international units of estrone. Available in capsules for oral administration; solution for intramuscular injection; and vaginal suppositories.

DIETHYLSTILBESTROL . . . A low cost synthetic estrogen possessing the physiologic properties of estrogenic substances derived from natural sources. Highly effective orally. Available in tablets for oral administration; solution for intramuscular injection; and vaginal suppositories.

For literature address Professional Service Dept., 745 Fifth Ave., New York 22, N. Y.

E·R·SQUIBB & SONS, NEW YORK
MANUFACTURING CHEMISTS TO THE MEDICAL PROFESSION SINCE 1858



Is there any help for an overworked doctor?

YES—BIOLAC, because it saves you valuable time. It's a complete infant formula and there are no extra ingredients to calculate.

Biolac provides completely for all nutritional needs of the young infant except vitamin C.

Prescribe Biolac routinely to reduce the possibility of errors and contamination in formula preparation. It requires only simple dilution with boiled water . . . as you prescribe.

NO LACK IN BIOLAC

Borden's complete infant formula

• *Biolac is prepared from whole milk, skim milk, lactose, Vitamin B_1, concentrate of Vitamins A and D from cod liver oil, and ferric citrate. It is evaporated, homogenized, and* sterilized. *For professional information, write Borden's Prescription Products Division, 350 Madison Avenue, New York City.*

EDEMA DURATION

due to the varying methods of cigarette manufacture
(as shown by rabbit-eye test)*



Upon instillation of smoke solution from PHILIP MORRIS Cigarettes

Average duration
8 MINUTES



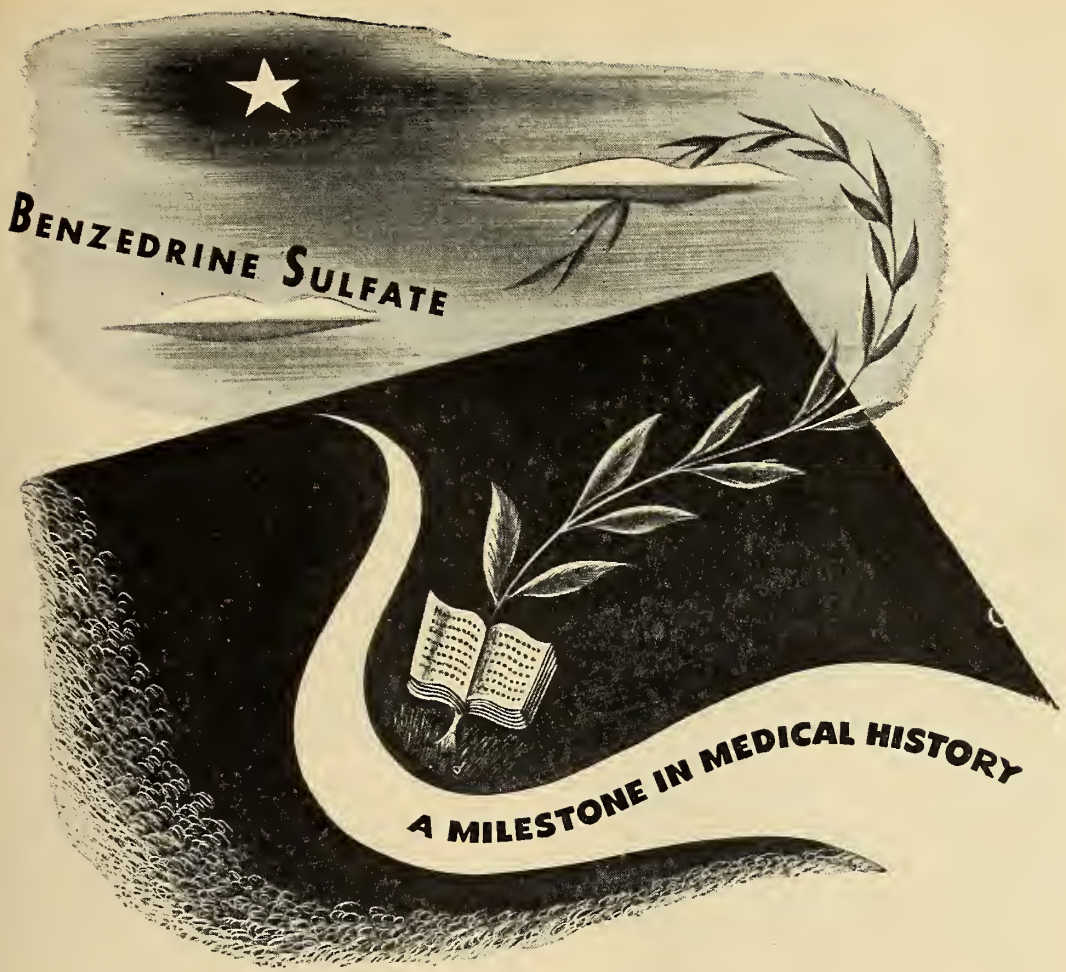
Upon instillation of smoke solution from cigarettes made by the *Ordinary Method*

Average duration
45 MINUTES

CLINICAL CONFIRMATION:**

When *smokers* changed to PHILIP MORRIS, every case of irritation of the nose and throat due to smoking cleared completely or definitely improved.

**Proc. Soc. Exp. Bio. and Med., 1934, 32, 241-245 ** Laryngoscope, 1935, XLV, No. 2, 149-154*



A decade or so ago, pharmacology had scarcely envisioned a non-narcotic drug capable of alleviating depression, that "common spectre of mankind".

Yet today, in Benzedrine, the medical profession has in its hands just such a therapeutic weapon—affording a rationale "which, in its very efficiency, cuts across the old categories".

So rapid has been the development of Benzedrine Sulfate therapy that it is hard to appreciate the revolutionary possibilities it has created in psychosomatic medicine—after only seven years of clinical use in this peculiarly difficult field.

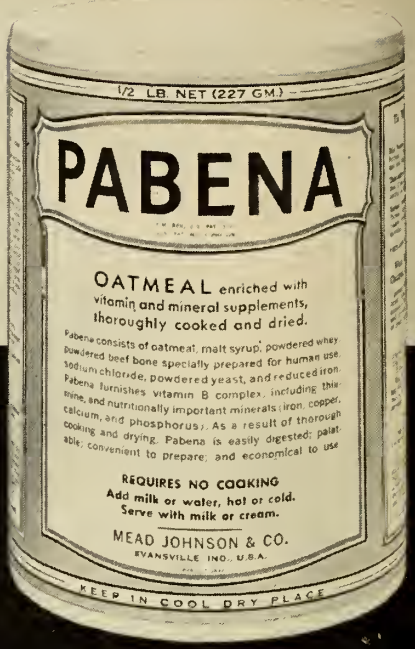
Although admittedly less dramatic than such life-saving agents as insulin and the sulfonamides, Benzedrine Sulfate may well rank, in the verdict of medical history, with the foremost discoveries of this era.

BENZEDRINE SULFATE TABLETS

(brand of racemic amphetamine sulfate)

SMITH, KLINE & FRENCH LABORATORIES, PHILADELPHIA, PA.





ACCEPTED
AMERICAN MEDICAL ASS'N.
Council on Foods

"Pabena Tastes Good, Too"

CHILDREN like the flavor of this new companion-cereal to Pablum. Mothers find that Pabena has all the convenience and economy of Pablum. Both cereals can be quickly prepared in the required amount simply by adding milk or milk formula. Pabena, like Pablum, is thoroughly cooked and is enriched with calcium, phosphorus, iron, and the vitamin B complex. Samples and literature sent on request of physicians.

Pabena is supplied in 8 oz. cartons. Pablum continues to be supplied in 8 oz. cartons and 1 lb.-2 oz. cartons.

MEAD JOHNSON & COMPANY

Evansville, Indiana, U.S.A.

MEAD'S
"WE ARE KEEPING THE FAITH"

ACCEPTED
AMERICAN MEDICAL ASSN
Council on Pharmacy and Chemistry

Zephiran CHLORIDE

Trade Mark Reg. U.S. Pat. Off.

Brand of Benzyl-Trialkonium Chloride

HIGH GERMICIDAL POTENCY

LOW TISSUE TOXICITY

Plus
Properties of
ZEPHIRAN
CHLORIDE
Detergent Properties
A Wetting Agent
High Tissue Tolerance
Penetration Ability
Rapid Action
Emollient Effect
Wide Application
Economy

A HIGHLY POTENT GERMICIDE with a low toxicity index is realized in ZEPHIRAN CHLORIDE, cationic detergent and germicide; a mixture of high molecular alkyl-dimethyl-benzyl-ammonium chlorides.

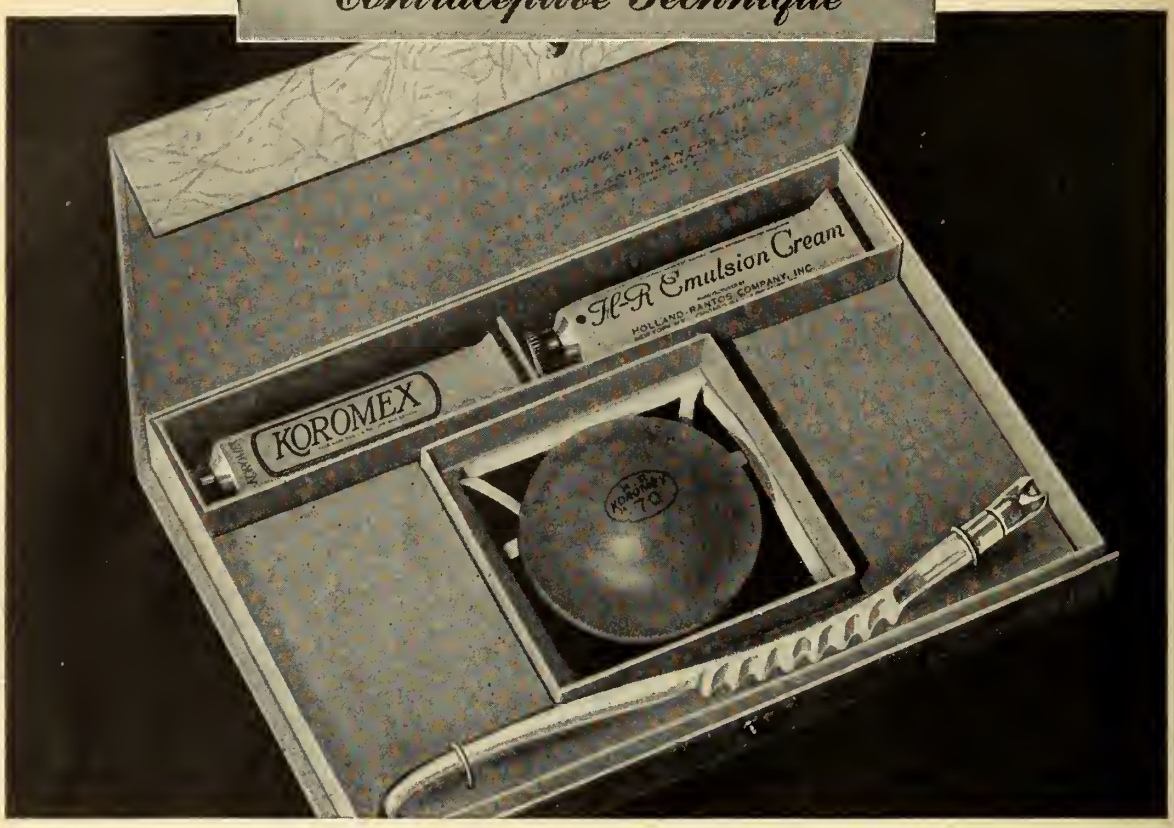
In an evaluation of germicides for clinical use by Hirsch and Novak,* using the phagocytosis inhibiting technic for determining toxicity, Zephiran Chloride was found to be germicidal in a 1:3970 concentration sterilizing infected blood completely, whereas the phagocytosis inhibiting concentration was shown to be 1:3370. The toxicity index of Zephiran Chloride thus is 0.85 as against an average of 5.2 for 70 per cent and 95 per cent alcohol and 900 for tincture of green soap.

*Hirsch, M. M., and Novak, M. V.: Evaluation of Germicides with Relation to Tissue Toxicity. Proc. Soc. Exper. Biol. and Med., June, 1942.

ZEPHIRAN CHLORIDE . . . Germicide for Surgery, Obstetrics and Gynecology, Urology, Dermatology, Eye, Ear, Nose and Throat, Sterile Storage of Instruments.

ALBA PHARMACEUTICAL DIVISION
WINTHROP CHEMICAL COMPANY, INC.
NEW YORK, N. Y. Successor WINDSOR, ONT.

A complete unit for Approved Contraceptive Technique



"THE KOROMEX SET COMPLETE"

Koromex Set Complete* is an attractively packaged unit containing the important items used for approved contraceptive technique. Identified by a removable label. To order or prescribe, merely write, "Koromex Set Complete, Diaphragm Size——".

Each Unit Contains...

KOROMEX DIAPHRAGM—Widely accepted as the outstanding diaphragm in use today. Durable. GUARANTEED FOR 2 YEARS.

KOROMEX TRIP RELEASE INTRODUCER —Specially designed swivel tip facilitates usage. Gauged to take all size diaphragms.

KOROMEX JELLY and H-R EMULSION CREAM—Both preparations have equally high spermicidal value, but differ in degree of lubrication. Both are included so the patient may determine which preparation better meets her requirements and personal preferences

** Price of Koromex Set Complete is only that of the Koromex Diaphragm and Koromex Trip Release Introducer*

Holland-Rantos
Company, Inc.

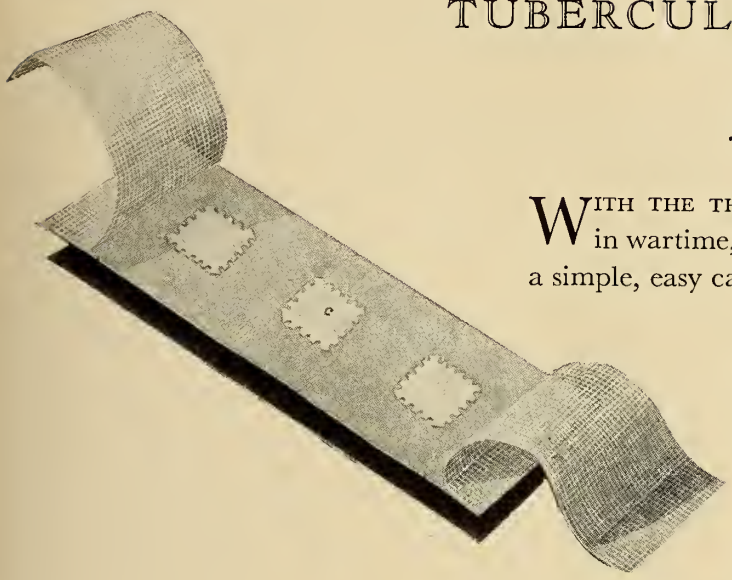
551 FIFTH AVENUE, NEW YORK, N. Y.

Find the unrecognized tuberculosis in your practice with

TUBERCULIN PATCH TEST

[VOLLMER]

Lederle



WITH THE THREAT of tuberculosis increasing in wartime, it is important to have available a simple, easy case-finding procedure.

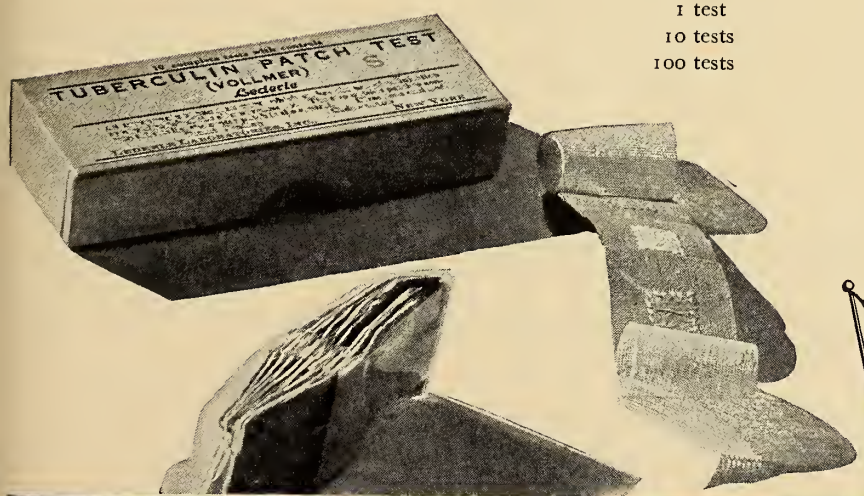
Tuberculin Patch Test (Vollmer) was introduced by *Lederle* in 1937. Since then the curve of demand for this diagnostic agent has shown a steady rise, and its use in public screening campaigns has become widespread.

The Patch Test has achieved recognition because of its—

- SIMPLICITY OF APPLICATION;
- RELIABILITY;
- READY ACCEPTANCE BY BOTH CHILDREN AND ADULTS.

Keep a supply in your office—use it frequently—you will be surprised at the number of suspects you uncover. Send for samples and literature.

PACKAGES:
1 test
10 tests
100 tests





BUY WAR BONDS AND STAMPS

LEDERLE LABORATORIES, INC., NEW YORK, N.Y. A UNIT OF AMERICAN CYANAMID COMPANY

PYOKTANIN SURGICAL GUT

Plain and Formalized

Manufactured Since 1899 by

The Laboratory of the Ramsey County Medical Society

Packaged dry in hermetically sealed glass tubes in accordance with the new requirements of the U. S. Pharmacopœia.

• • •

Price List

PLAIN TYPE A NONBOILABLE
AND
FORMALIZED TYPE C NONBOILABLE

Sizes.....000 — 00 — 0 — 1 — 2 — 3
28 inches.....per dozen strands $2.00
60 inches.....per dozen strands $3.00

Special discount to hospitals and to the trade. Cash must accompany the order.

• • •

Address

LABORATORY RAMSEY COUNTY MEDICAL SOCIETY

Lowry Medical Arts Building, St. Paul, Minnesota

FOR SALE BY SURGICAL DEALERS AND DRUGGISTS

Upjohn Diethylstilbestrol Perles

for easy control of dosage



ACTUAL SIZE

Rapid relief from vasomotor and mental symptoms of the menopause depends on careful control of dosage. With Upjohn Diethylstilbestrol Perles this dosage control is easy, flexible. For oral use there are now four Perles in different strengths from which to choose. Each Perle is color-coded. It bears a bright, quickly-identified color which helps the physician and the dispensing pharmacist to recognize the potency—light green, 0.1 mg.; green, 0.25 mg.; blue-green, 0.5 mg.; blue, 1.0 mg.

Upjohn Diethylstilbestrol Perles are indicated wherever an estrogenic effect is desired. They have been found of particular value, not only during the menopause, but in senile vaginitis, in gonorrheal vaginitis, and in relieving or preventing painful engorgement of the breasts during suppression of lactation.

"The therapeutic use (of Diethylstilbestrol) has been demonstrated to be effective for all those conditions recognized to respond to the natural estrogens." N. N. R.

Upjohn Diethylstilbestrol Perles are available in each of the four potencies in bottles of 100 and 500

Upjohn
KALAMAZOO, MICHIGAN

ANOTHER WAY TO SAVE LIVES . . . BUY WAR BONDS FOR VICTORY

Woman's work



EVERYWHERE women are carrying a wartime load—the doctor's wife with absent spouse—the nurse doing double duty while her colleague serves in a foreign land—the girl who does a man's work in industry to free another fighter for the United Nations.

In times like these the Lilly tradition of quality is appreciated more than ever by those who are responsible for Lilly products. Meticulous methods of standardization, production, and inspection are so much a part of the Lilly structure that new workers quickly sense their obligation to carry on no less efficiently than the men they have replaced.

Lilly

BUY WAR BONDS AND STAMPS

ELI LILLY AND COMPANY • INDIANAPOLIS, INDIANA, U. S. A.

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 August, 1943 No. 8

COMPRESSION FRACTURES OF THE SPINE

C. CURRY BELL, M.D.
Saint Paul, Minnesota

FRACTURES of the spine are important because the vertebral bodies are weight-bearing structures and because of the danger of associated damage to the spinal cord. Failure to correct deformity following such fractures changes the spinal curve and subjects the ligaments and muscles to abnormal stress which may cause a varying degree of permanent disability. Damage to the cord, other than simple contusion, cannot be repaired and may produce grave consequences. Complaints of pain, tenderness and limitation of motion are so common in individuals seeking damages following injuries to the back that one is frequently inclined not to take such complaints seriously. Because of the danger, however, of overlooking a compression fracture following even apparently slight injury, it is advisable to x-ray the spine in all back injuries. The main danger in failure to discover and adequately treat even a slight compression of a vertebra is that, as time passes, the degree of compression may increase with weight-bearing and cause real disability that could easily have been avoided.

Etiology

Compression fractures are not common in the first two decades because of the elasticity of intervertebral discs which permit a limited degree of bending strain without undue stress on the bodies of the vertebræ. These fractures are most common in the third and fourth decades when the discs have become less elastic, the vertebral bodies more highly calcified and more brittle, and the individual is still very active. Compression fractures are caused by a lever action resulting from a force so applied as to cause a jack-knifing of the spine, such as being struck by a falling object while in a stooping position, or falling in a sitting position, or on the head or shoulders. They are occasionally caused by falling from a height and striking on the feet and are then sometimes complicated by a fracture of the os calsis of one or both feet. Tobogganing is a common cause of compression fractures of the spine, because of the fact that making a jump while sitting on a toboggan results in a greater or lesser degree of forceful flexion of the spine. These fractures may occur in any part of the spine, but about two-thirds are in the lower portion, and most of these in the region of the eleventh and twelfth dorsal and first and second lumbar vertebræ.

Symptoms

The symptoms depend, of course, upon the location and extent of injury and may vary from pain with no external evidence of injury to complete motor and sensory paralysis with marked kyphosis and occasionally lateral deviation. The most constant symptoms are pain and tenderness which are increased on motion. With cord injury, motor and sensory paralysis may be partial or complete, and will be found up to the level of the lesion with an area of hyperesthesia just above the lesion. In complete tranverse lesions of the cord, the symptoms appear immediately with complete motor and sensory paralysis, flaccidity of the muscles, visceral paralysis and loss of the knee jerks. In partial lesions there may be an interval before the symptoms develop.

Read at the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, May 17, 1943.

Some of the muscles are paralyzed and some are not, and there may be some muscle spasm. Some sensation remains, the knee jerks are usually present, and visceral paralysis may be absent.

Diagnosis

A history of an injury that might have caused sudden forceful flexion of the spine, followed by pain and tenderness, and aggravated by motion, is always suggestive of vertebral injury. In addition to this, there may be deformity or evidence of damage to the cord. The Soto-Hall sign is nearly 100 per cent accurate in diagnosis of these fractures. In this test acute flexion of the neck stretches the ligamentous attachment to the vertebræ, resulting in pain at the site of fracture. Definite diagnosis, however, is dependent upon good anteroposterior and lateral x-ray studies. The lateral view is especially important because of the fact that a moderate degree of compression cannot be seen in the anteroposterior view. Occasionally the only x-ray evidence of fracture is an area of increased density in the anterior margin of the vertebral body.

Treatment

First Aid.—In fractures of the cervical portion of the spine extension should be maintained by a pad under the back of the neck. The patient should be moved only with enough traction applied to the head to insure immobilization. In the lumbo-dorsal fractures, the patient should be transported in a prone position or in a supine position with a pillow or folded blanket under the site of fracture in order to maintain extension and prevent further injury. On arrival at a hospital x-ray studies should be made immediately, unless contra-indicated by the patient's general condition.

Active Treatment.—Formerly these fractures were treated mainly by prolonged bed rest with fixation by a plaster cast or a hyperextension frame with the hope of correcting the deformity and securing bony union. Fusion of the spine at the site of the fracture has also been attempted with the hope of preventing or lessening permanent disability. These methods proved unsatisfactory and usually resulted in a varying degree of permanent impairment of function. More recently various methods have been devised to correct actively the deformity of the vertebral body by extreme hyperextension and fixation of the spine in that position. This procedure may be carried out under either local or general anesthesia, but a general anesthetic gives better relaxation and thereby facilitates adequate reduction. The method of choice, considering its efficiency and the ease with which it is accomplished with a minimum of assistance, is as follows: Two tables are placed parallel, a short distance apart. Being careful to maintain extension, the patient is placed on his back on one of the tables and given a general anesthetic. When fully anesthetized, care is again taken to maintain extension as the patient is turned face downwards and across the tables so that the upper third of the chest rests on one of the tables and the upper third of the thighs on the edge of the other, the portion of the body between the upper third of the thighs and the upper third of the chest extending, without support, between the tables. An assistant then elevates the lower extremities to an angle of approximately forty-five degrees from the surface of the table. With the patient in this position enough downward force is applied at the site of the fracture to correct the deformity and reduce the fracture. In impacted compressions a great deal of force is necessary to secure reduction and it must be remembered that there is greater danger of applying too little force than too much. After reduction the position of hyperextension is maintained while a padded plaster jacket is applied. The plaster should extend from the middle of the sacrum to the upper dorsal region, and should be well molded around the iliac crests and along the spine. When the plaster has hardened sufficiently the patient is returned to bed and placed on his back with a pillow or folded blanket supporting the concavity of the plaster jacket. A large window in the epigastric region of the plaster adds to the comfort of the patient. It is necessary to maintain the position of hyperextension for from six to ten months, depending upon the extent of injury and x-ray evidence of repair. In uncomplicated cases the patient may become ambulatory within a week or ten days. The plaster jacket may be worn for three or four months and then replaced by a Taylor brace. For purposes of cleanliness and comfort, however, it is advisable to replace the plaster by the brace at the end of a month from the time of reduction. The prolonged immobilization causes atrophy and weakness in the muscles of the back, and

may result in some permanent disability even with good reduction and union, if daily exercises are not indulged in. Wearing the removable Taylor brace makes it possible to apply massage to the affected muscles as an adjunct to the exercises. Care should be taken to maintain hyperextension when the brace is removed for massage. It must be impressed upon the patient that his full coöperation is necessary in the use of routine daily exercises in order to avoid permanent disability. In measuring for the Taylor brace the patient should be placed face downwards in bed, the cast bivalved, and the posterior half removed. At this time the lower extremities and the upper part of the chest should be elevated sufficiently to maintain full hyperextension. If this is not done, the curve of the brace will not be correct, and in wearing the brace some of the hyperextension will be lost and may result in a greater or lesser degree of recompression of the vertebral body.

Cord Injury

In complete transverse lesions of the cord, as evidenced by complete motor and sensory paralysis, operative treatment can accomplish nothing because the cord cannot be repaired. In partial lesions of the cord operative intervention may or may not be worth while, usually not. The only hope of accomplishing anything by operation is the relief of pressure, which is seldom present. Usually the partial lesion is due to contusion or crushing of part of the cord or to hemorrhage into the cord. Nothing can be done for the crushing, and the hemorrhage may be at a point well removed from the site of fracture, and consequently cannot be located even with the cord exposed. Conservatism, then, should be the watchword in the treatment of cases complicated by cord injury.

Time does not permit detailed consideration of all the complications following injury to the cord. Briefly, however, it is very important to guard against infection of the bladder, maintain adequate elimination from the bowel, and prevent pressure sores. These precautions, of course, demand careful observation and constant skilled nursing care.

Because of support afforded by the chest wall, fractures in the thoracic region, except in the eleventh and twelfth vertebræ, are seldom so severely compressed as are those in the lumbar portion of the spine. Consequently, they are not so frequently accompanied by injury to the cord. It is also true that because of resistance to manipulation offered by the chest wall, reduction is not so readily accomplished in this portion of the spine. Because of this the best method of treatment of compression fractures in the dorsal region, above the eleventh vertebra, is bed rest with hyperextension until reduction is secured. The bed should be one which can be angulated to whatever degree is necessary to maintain adequate hyperextension. When lateral x-ray studies show satisfactory position, either a plaster jacket or a Taylor brace may be applied and the treatment continued as for similar fractures in the lumbar and lumbo-dorsal regions.

In the cervical region, reduction may be accomplished by either traction or manipulation. Traction is best applied in the following manner: Apply a sling or halter to the head. To this attach a weight of 10 or 15 pounds suspended over a pulley at the head of the bed with the head of the bed elevated for countertraction. After reduction is demonstrated by lateral x-ray studies, the traction apparatus may be replaced by a plaster jacket which immobilizes the head and neck. This may be worn until union is secured or it may be replaced by a rigid leather jacket with immobilizing collar, which is probably more comfortable. Some years ago Dr. A. S. Taylor of New York developed a successful method of manipulation for cervical fractures. According to his method a sling or halter is applied to the head and the ends of a rope are attached to the sides of the sling, the rope being long enough to pass around the waist of the surgeon. As the head is steadied and the position controlled by the hands, traction is applied by backing against the rope. In order to disengage the articular processes, traction is first applied in slight flexion until the neck is felt to elongate. The head is then dropped backwards until the spine is in extension. Reduction is then checked by x-ray and an immobilizing plaster jacket applied.

Prognosis

Although fractures of the spine have serious possibilities, when recognized early and adequately treated, the outlook is favorable for complete restoration of function in the uncomplicated cases. In cases in which the cord is damaged, the prognosis depends largely upon the location and extent of injury and upon the competency of the surgical and nursing care given.

INTERTROCHANTERIC FRACTURES

MYRON O. HENRY, M.D.

Minneapolis, Minnesota

IN the early nineteen-twenties, as x-ray technique improved, surgeons began to realize that the results of fractures of the hip were not good. The American Orthopædic Association collected some end results in 1929, and found that the mortality in intracapsular hip fractures was about 28 per cent, and that only 30 per cent of the survivors obtained bony union when treated by closed methods. Tremendous impetus was given to the study and treatment of fractures of the hip by Smith-Petersen who devised the three-flanged nail for treatment of intracapsular fractures of the hip. As surgeons learned to reduce fractures of the hip by the Leadbetter method, and became skillful in introducing the Smith-Petersen nail,[12] results improved, and mortality was reduced in intracapsular fractures.

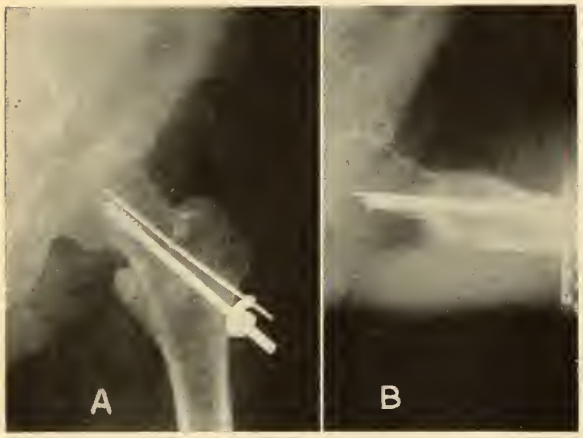


Fig. 1. M. O. Henry's screw-bolt for transcervical and basal fractures; auxiliary pin to prevent rotation. (*a*) Anteroposterior and (*b*) lateral views.

For some time, the term "fractures of the hip" was loosely applied to all hip fractures, and internal fixation was also loosely used, and perhaps sometimes misused. As the characteristics of the various types of hip fractures became better known, methods of treatment became more standardized, and internal fixation became limited almost entirely to intracapsular fractures. The Smith-Petersen nail is now generally acknowledged as the best means of fixing intracapsular fractures. There remains only the choice of introduction under direct vision, or "blindly" from the lateral side. Under the stimulus of Smith-Petersen's leadership, other devices for internal fixation were devised, such as the author's screw-bolt[6,7,11] and Moore's multiple pins. While some of these were satisfactory, they were seldom better than, and often not as good as, the Smith-Petersen nail for fixation of *intracapsular* fractures.

Those fractures lateral to the capsule—the so-called "transcervical," or "basal," fractures—present a problem different from that of intracapsular fractures. Here not only accurate reduction and firm immobilization must be secured, but also mild compression is desirable. This is the type of fracture in which the screw-bolt is the method of choice (Fig. 1 *a* and *b*).

Internal fixation in intracapsular, transcervical, and basal fractures has shortened the healing period; it has lowered the mortality, and raised the percentage of bony union. The patients are more comfortable, the hospitalization is shorter, and the expense is less. All of these factors have combined to widen the field of application of internal fixation in hip fractures.

Trochanteric fractures, heretofore, have often been dismissed with the mere statement that "they always heal." This is true, providing the patient survives. At present the mortality in trochanteric fractures is higher than in intracapsular fractures. According to Leydig and Brooks,[9] the mortality in a series of over 600 intertrochanteric fractures varied from 25 to 39 per cent. This may be due, in part, to the greater age of the patient—seventy is the average[6]—but it is due also to the prolonged stay in bed, for none of these fractures is solidly united in less than sixteen weeks. Treatment of trochanteric fractures is sometimes varied according to the type of fracture. Bohler[7] recommended pin traction for ten to fourteen weeks in nearly all types. This requires bed rest for about ten weeks, and often ends in coxa vara deformity and shortening. Key and Conwell[8] advised nails or pins in basal fractures and also in intertrochanteric frac-

Read at the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, May 17, 1943.

tures in which the lateral femoral cortex is intact.

Comminution of the trochanteric region has been the deterrant to internal fixation methods in these fractures. Fixed skeletal traction in plaster is sometimes used successfully, but this method also requires a long period of bed rest. Trochanteric fractures without too much comminution of the femoral cortex can be held by the screw-bolt, or by the screw-bolt and an auxiliary pin. Moore pins[10] may be introduced from various angles and, while lacking the factor of compression inherent in the screw-bolt, they can be employed either in basal fractures (especially if slightly impacted), or in comminuted fractures, to peg on fragments (Fig. 2 *a* and *b*). Sometimes the extent of comminution is not revealed by the x-ray, and the surgeon who plans to nail an intertrochanteric fracture may find, to his chagrin, that he has only loose fragments through which to drive his nail. To meet this contingency, Lawson Thornton has devised a plate which can be screwed onto the femoral shaft lower down and attached to a Smith-Petersen nail. The flanged nail is hard to withdraw from the neck in the face of comminution of the lateral cortex. While pins are easier to introduce and withdraw, they do not hold in lateral fractures with comminution where there is only a thin shell of cortex.

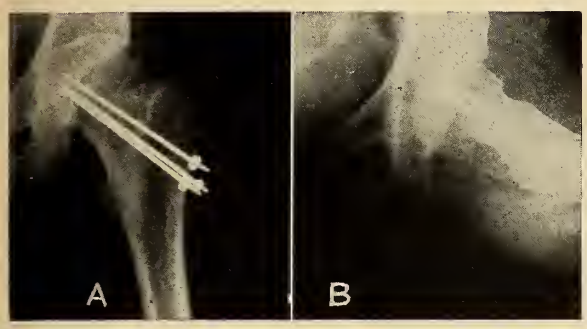


Fig. 2. Austin Moore pins in transcervical fracture. *(a)* Anteroposterior and *(b)* lateral views.

Roger Anderson's method[1] of multiple pins with fixation clamps externally, meets many of the above objections. It requires more skill for application and is prone to infection around the pins. The expensive "Frac-Sure Kit" is needed for its application.

Blount,[3] of Milwaukee, has perfected a blade-plate which bids fair to overcome all the above objections. Originally devised to fix Schanz osteotomies, like the Neufeld and Austin Moore plates, the Blount blade-plate lends itself admirably to fixation of all types of intertrochanteric fractures lateral to the basal fracture (Fig. 3). It can be employed regardless of degree of comminution, even in subtrochanteric fractures.[4]



Fig. 3. Comminuted introchanteric fracture. Blade-plate fixation, Blount's case.

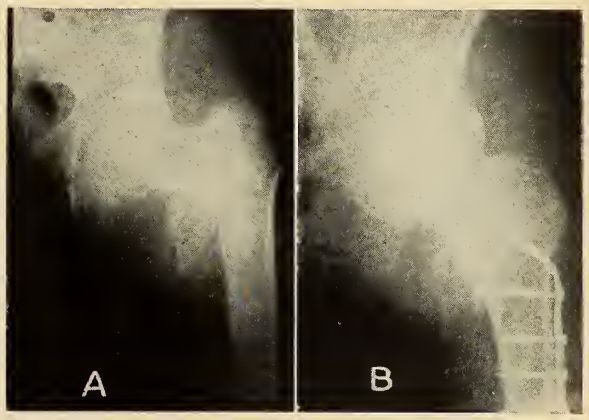


Fig. 4. Comminuted intertrochanteric fracture. (*a*) Before and *(b)* after blade-plate fixation.

The fracture is reduced by gentle traction, with abduction and internal rotation if indicated. While held by an assistant in this position, a long lateral incision is made downward from the trochanter to expose the upper portion of the femur. If there is much comminution of the lateral side of the trochanter, a pin may be introduced to fix the fragments of the head and neck either permanently, as in Blount's case above, or temporarily. A nick chiseled in the cortex of the femur allows the blade to be driven into the neck (Fig. 4 *a* and *b*). The angulation of the blade-plate should be determined accurately from a

study of an x-ray of the sound side. It is usually an angle of about 140 degrees, but the angle of the blade-plate can be changed at the operating table with small sterile wrenches. Lateral x-rays are necessary at this point before driving the

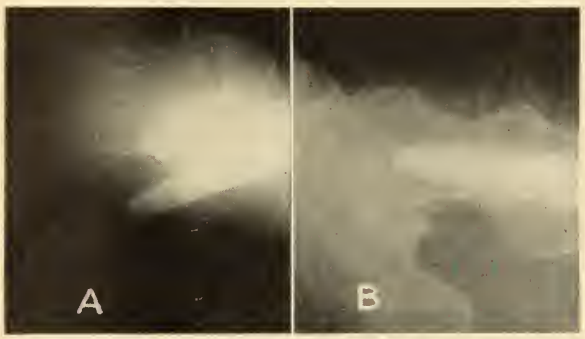


Fig. 5. (*a*) Lateral of Figure 4 *b*. Blade-plate did not penetrate neck. (*b*) Lateral of same case after reinsertion.

blade into the neck. One might assume, having seen the neck of the femur, that the blade-plate can be driven centrally into the neck with care. If the angle of the fracture is open posteriorly, the entrance of the blade into the proximal fragment of the neck may only open the gap wider, and the blade will not penetrate the neck (Fig. 5 *a*). After driving the blade home into the fragment of the head and neck, the plate is clamped to the shaft with a Lambotte clamp and check-up x-rays are taken (Fig. 5 *b*). Then screw-holes are drilled through the shaft of the femur, and the plate is fixed firmly to the shaft with four or five screws which bite through the medial cortex of the bone.

No external fixation is required with this device. The patient is more comfortable and has less pain than with any other method. He may sit up in bed, turn, and be up in a wheel chair, although weight-bearing is not permitted until x-rays indicate bony union. While only a small series of cases has been done by this method, it seems to solve many of the problems of intertrochanteric fractures. If the patient is a fair risk for an operation requiring about an hour, this method of internal fixation seems to be the procedure of choice regardless of the degree of comminution.

Summary

1. The Smith-Petersen nail is probably the best method of treating *intracapsular* fractures of the hip.

2. Nails and pins may be satisfactory in *transcervical* fractures but the screw-bolt is superior.

3. The Blount blade-plate is the method of choice in all types of true *trochanteric* fractures.

Bibliography

1. Anderson, Roger: Intertrochanteric fracture. J. Bone & Joint Surg., 25:155, (Jan.) 1943.
2. Bartels, W. P.: Treatment of intertrochanteric fractures. J. Bone & Joint Surg., 21:773, (July) 1939.
3. Blount, Walter P.: Personal communication, December 2, 1942.
4. Blount, Walter P.: Blade-plate internal fixation for high femoral osteotomies. J. Bone & Joint Surg., 25:319, (April) 1943.
5. Bohler, Lorenz: Treatment of Fractures. Wm. Wood & Co., 1935, p. 334.
6. Henry, Myron O.: Proximal osteosynthesis in intracapsular fractures of the hip. J. Bone & Joint Surg., 13:531, (July) 1931.
7. Henry, Myron O.: Intracapsular fractures of the hip. J. Bone & Joint Surg., 16:169, (Jan.) 1934.
8. Key and Conwell: Fractures, Dislocations and Sprains. p. 967. C. V. Mosby Co., 1942.
9. Leydig and Brooks: Treatment of pertrochanteric fractures. J. Missouri M. A., 37:354, 1940.
10. Moore, Austin T.: Fractures of the hip joint. J. South Carolina M. A., 30:199, (Oct.) 1934.
11. Putti, V.: Indirizzo e metodica nella cura delle fratture del collo del femore. Chir. d. Org. di movimento, 23:399-429, (June) 1938.
12. Smith-Petersen, M. N.: Intracapsular fractures of the neck of the femur. Arch. Surg., 23:715, (Nov.) 1931.

UNUNITED FRACTURES

MELVIN S. HENDERSON, M.D.

Rochester, Minnesota

UNUNITED fractures may be divided into two groups: those delayed in uniting and those which are in a fixed state of nonunion. In fractures delayed in uniting, there is evidence of formation of new bone and an attempt at repair is still in progress, while in those in a fixed state of nonunion there is no indication of any attempt at bony repair—nature has been defeated and has given up. No arbitrary time limit can be set to designate into which group any given fracture will fall. Union may be in a delayed condition many months after the injury and a fracture may be in a state of nonunion as early as three months following the accident. In either group

From the Section on Orthopedic Surgery, Mayo Clinic, Rochester, Minnesota. Read at the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, May 17, 1943.

there may be considerable malposition of the fragments, which definitely complicates the treatment. The most common sites of ununited fractures are the lower third of the tibia, the lower third of the humerus and the neck of the femur.

Etiology

Etiologic factors in ununited fractures are numerous but may be placed under two headings: general and local. In the former, some constitutional disturbance may be a factor. This may be seen in the rare cases of osteogenesis imperfecta in which multiple fractures occur and, occasionally, in certain generalized disorders such as von Recklinghausen's multiple cystic degeneration of bones. In a very few, tumors of the parathyroid are found. Such factors are rare. Patients who have ununited fractures, in a state either of delayed union or of nonunion, are usually robust, healthy and in the active period of life. Syphilis rarely, if ever, is a factor. Even congenital pseudo-arthroses of the tibia are probably due to some local abnormality.

Many of the ununited fractures follow severe contusing injury in which the fracture frequently is comminuted and the muscles, tendons, nerves and blood vessels are traumatized as when a leg is crushed, for example, by being run over by an automobile, or when a patient's arm is caught in a belt or wheel and twisted. The insult to all tissues is great, leaving them below par so that the physiologic attempt to establish repair is slow and tedious. Often, in such cases, hematomas are formed and swelling follows; the damaged muscles, tendons, and so forth become necrotic and slough. This broken-down mass of muscle and blood clot gradually liquefies and is acid in character. The phosphatase enzyme in the blood (which has to do with the precipitation of phosphoric esters from the blood) works best in an alkaline medium and its action is inhibited quite definitely in the face of this mass of broken-down tissue and debris—acid in character. This is an argument in favor of early evacuation of a collection of this kind, even if the fracture is not compound. Many fractures of the type just described are compound and then infection is too often a further complication.

Another cause of delay in union of fractures is inadequate reposition of the fragments, but at least a third of the diameter of the bone ends should be in contact. If the fracture is not always obtain perfect reposition of the fragments, but at least a third of the diameter of the bone ends should be in contact. If the fracture is near a joint it is essential that there should be no angulation and that the line of weight-bearing be nearly normal. The interposition of muscle between the fragments (particularly in the shaft of the femur and humerus) may be of such amount that the callus thrown out by the bone ends cannot amalgamate across this tissue. If one has reason to believe there is muscle between the bone ends, there should be no hesitation about opening down on the fracture to pull the muscle from between the fragments.

Another deterrent factor to the formation of union is inadequate retention of the fragments. After the fracture is reduced, one must bear in mind that there is a constant pull of the muscles and unless the fragments are held in normal alignment, angulation and even marked displacement of the bone ends may occur if adequate splintage is not provided. Fractures should be held quiet and protected.

Another etiologic factor, which has come to our attention more recently, is fixed overtraction. It has been advocated that fractures be reduced by traction and held with pins placed through the fragments and that the pins be secured to a special outside plate or held imbedded in the plaster-of-Paris cast. No argument can be raised against the mechanical principles involved but it must be kept constantly in mind that in practically every fracture absorption occurs at the bone ends and if the fixation is absolute it will not permit the small amount of shortening necessary to keep the bone ends in contact. As a result, they will remain slightly separated and bone does not bridge a gap readily even though the gap is very small. This is a cause of nonunion which is becoming more prevalent as the foregoing method of treatment becomes more widespread. Many excellent methods for the treatment of fractures are sound from a mechanical viewpoint but one must bear in mind constantly that one is dealing with living tissue which is astonishingly capable of repair, even under certain unfavorable conditions produced by natural though faulty attempts at repair, but when one introduces man-made barriers, such as the overtraction mentioned, nature does not cope with them so readily.

Too early function may so strain the union that it becomes weakened and may never become solid, particularly in fractures of the lower extremities. This may occur in fractures of the tibia and fibula; the fibula may unite solidly but

the tibia may not and the former acts as a pivot around which the fragments of the tibia swing.

Prophylaxis is the best method of handling almost any situation, and so it is in the treatment of fractures. If the surgeon treating fractures will remember the three "R's"—reduction, retention and restoration—he will have very few fractures which fail to unite. Reduction must be complete, and after reduction has been accomplished, the fragments must be retained in correct alignment until healing occurs. The patient must be observed carefully during the period when function is being restored to be certain too much strain is not thrown on the union. Before weight-bearing is permitted in cases of fracture of the lower extremity, one should see in the roentgenograms bony trabeculations crossing the line of fracture. There is no definite timetable that can be applied to determine when a fracture is united solidly.



Fig. 1 *(Left)*. Case 1. Typical nonunion of tibia and fibula; note absence of any attempt at repair. Man aged twenty-four years.
Fig. 2 *(Right)*. Case 1. Union of tibia by aid of bone graft held with beef bone screws; fibula disregarded.

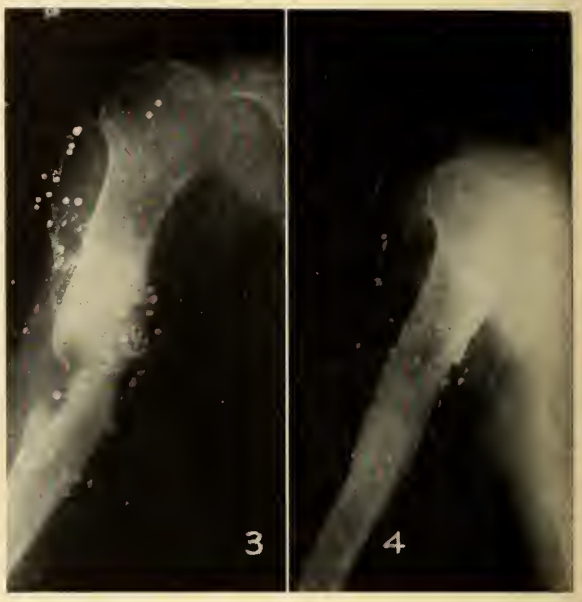


Fig. 3 *(Left)*. Case 2. Nonunion of upper third of humerus; old compound shotgun injury. Boy aged sixteen years.
Fig. 4 *(Right)*. Case 2. Seventeen years after bone grafting operation; firm union; full function.

Selection of Cases for Surgical Treatment

The problem of determining when to abandon conservative measures and resort to surgical treatment of fractures is not a simple one and there are no hard and fast rules. However, there are certain conditions which should exist at the site of fracture before surgical treatment is undertaken. One must be certain the bone forming activities are totally quiescent or are so retarded that too much time will be lost if operation is not undertaken. It may be that union would occur after many months in a given case, but in most instances the patient would prefer an operation to secure union in a few months rather than to be incapacitated for an indefinite period. Delayed union may drift into nonunion after many months of watchful waiting.

Many ununited fractures are compound and in such cases it is extremely important that all local signs of infection have subsided before any surgical treatment is undertaken, unless it be of a type necessary to clean up the infection, remove sequestra, and so forth. If there is any doubt about this, a practical test is to submit the extremity to physical therapeutic measures such as heat, massage and active and passive movement. If the previously infected region becomes red, sore and tender, one must be very cautious about intervention, and operation should be deferred until these signs are absent.

Sulfonamide Compounds

The sulfonamide compounds have been of great value in the surgical treatment of fractures previously infected. Before operation the drug

should be given by mouth for three to four days until the proper level in the blood stream is attained,* and at the time of operation the sterile sulfonamide compound should be placed in all layers of the wound. In our experience it has never interfered with bony repair. Care must be taken to see that the drug, particularly sulfathiazole, is not used in the wound in such large quantities that it becomes caked. If this happens, it may act as a foreign body. The drug should be sprayed or spread on in a thin layer. I am confident that by using these drugs we have been able to operate successfully in the type of case wherein, before the use of the sulfonamide compounds, surgery had been usually doomed to failure in a large percentage because of a flare-up of the old infection.

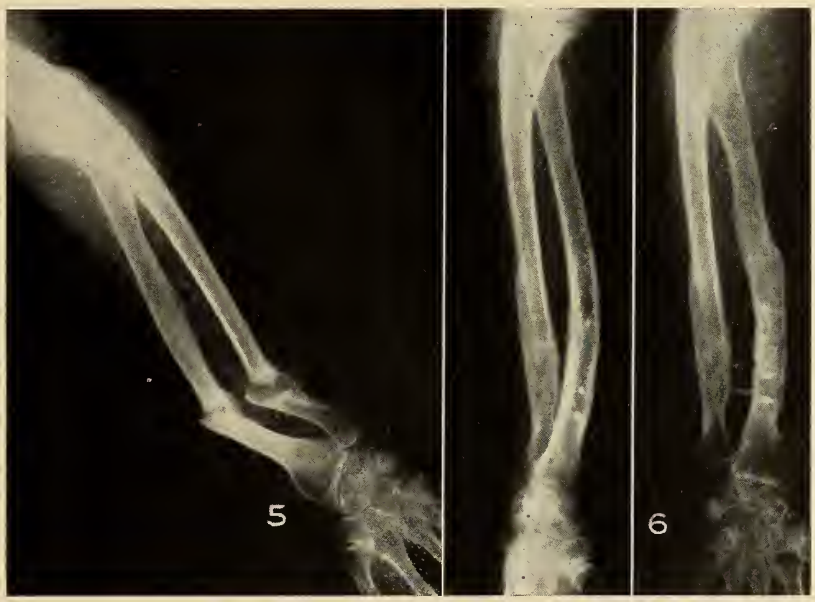


Fig. 5 *(Left)*. Case 3. Nonunion of radius and ulna, six months' duration; woman aged sixty-one years.
Fig. 6 *(Right)*. Case 3. Union in both bones fifteen months after operation. Note beef bone screws almost absorbed.

Massive On-lay Bone Graft

The most useful type of surgical treatment at our command for fractures, either delayed in uniting or in a fixed state of nonunion, is the bone grafting operation. For many years we have used what we call the massive graft, referred to by the late Willis Campbell as the on-lay graft to distinguish it from the inlay graft of Albee. This graft is large and strong and has abundant contact with the fragments; it might well be called the massive on-lay graft. It acts not only in a physiologic rôle but also in the rôle of providing fixation. The bone graft should be autogenous and should be held firmly to the fragments by some means after they have been prepared thoroughly, the fibrous material between the bone ends has been removed, the medullary cavity opened in each and firm contact of the ends of the fragments to each other assured (Figs. 1, 2, 3, 4, 5 and 6). In former years, we used beef bone screws to hold the graft to the fragments, but in more recent years we have employed vitallium screws. The latter are well tolerated by bone and can be inserted more easily than beef bone screws. In the event of infection in cases in which beef bone screws have been used, the latter are very troublesome because, becoming partially absorbed, they become fragmented and are difficult to remove. This is particularly true when the screws penetrate both cortices of the fragment. The vitallium screws are nonabsorbable and can be removed readily if infection occurs.

Occasionally the fragments of bone are so osteoporotic that screws will not hold. In that event it may be necessary to place Parham bands around both fragments and the graft (Figs. 7

*Sulfanilamide or sulfathiazole may be used; the latter is probably preferable. In this type of case a blood level of 8 mg. per 100 c.c. is the goal for the average person. Seventy-five grains (5 gm.) per day is usually sufficient.

and 8). Multiple chips of bone (spongy bone if it can be obtained) may be packed about the line of fracture. However, if a wound should become infected, these small fragments are troublesome; therefore, they should be used in moderation and only where they will be most effective, namely, at the site of the fracture. Adequate postoperative protection is best provided by a plaster-of-Paris cast.



Fig. 7 *(Left)*. Case 4. Nonunion, two years' duration, with fragile osteoporotic fragments. Woman aged forty-two years.
Fig. 8 *(Right)*. (Case 4). Union obtained by aid of bone graft held with Parham bands; eighteen months after operation. Bands removed later.

Conclusions

1. Ununited fractures fall in two groups: those in a state of delayed union and those in a fixed state of nonunion.

2. Etiologic factors are general and local. The former are rarely significant. Local causes are the important ones. They include severe contusing injuries (frequently compound), inadequate reduction of fragments, interposition of muscle between the bone ends, inadequate retention of fragments permitting slipping and overtraction caused by the use of pins and too early function.

3. Surgical treatment should be undertaken only when the fracture is in a state of nonunion or when union is delayed and unpredictably prolonged. Reparative work is contraindicated so long as there is any sepsis or inflammation at the site of fracture.

4. Sulfonamide compounds have been a definite aid in those cases in which the wound has healed at the time surgical intervention is considered although it had been infected previously. Before the introduction of the sulfonamide compounds flare-ups of the old infection recurred in a high percentage of these cases when operation was carried out, but if the sulfonamide compounds are given by mouth and inserted locally as each layer of the wound is closed, infectious flare-ups following operation will be much less common than if they are not used.

5. The use of the massive on-lay bone graft is the procedure of choice. The graft should be autogenous, long and thick. The fragments must be prepared carefully by excision of the mass of fibrous tissue between them, by freshening the bone ends (opening the medullary cavity in each), fitting them so they have firm contact with each other, and by carefully freshening areas of the cortices against which the bone graft is to be placed. The graft must be held firmly against the cortices. Of recent years we have used vitallium screws to accomplish this but occasionally we have resorted to Parham bands when the fragments were too osteoporotic to furnish a good foundation for the screws.

6. Adequate postoperative external splinting must be provided in all cases. Plaster-of-Paris is our choice.

LACK OF ANATOMICAL CHART FAILS TO STUMP INSTRUCTOR

A lieutenant instructor was detailed to give lessons in first aid in case of dangerous bleeding from severed arteries, relates the *Infantry Journal* (July). There wasn't any anatomical chart showing the location of the blood vessels, such as every well-equipped schoolroom can display before its pupils.

The young officer was nothing if not ingenious. Singling out a long, lean soldier from his class, he ordered him to strip. Then with a piece of lipstick he traced the human arterial system on the private's goose-pimpled hide. With such a large-as-life-and-twice-as-natural chart, the lesson was a great success.

Now lipstick is standard equipment in that outfit.—*Science News Letter*, July 24, 1943.

FRACTURES OF LOWER END OF RADIUS AND ULNA

C. C. CHATTERTON, M.D.
Saint Paul, Minnesota

BECAUSE of the frequent question, "How do you treat your Colles' fractures?" I have the temerity to present, in an academic way, the consideration of fractures of either radius or ulna at the lower end. This is perhaps the most common of the fractures we are called upon to treat, except those of the ribs or clavicle. Because of difference in type and severity, there is a classification for adults and one for children, primarily because of the difference in reaction to stress and strain in young bones as compared with those of the adult or aged, because the epiphysis is rarely united with the shaft at the lower end of the radius before the age of eighteen.

The different types seen in adults and children may be classified as follows:

In Adults

1. Styloid fractures
2. Barton's fracture—anterior or posterior fracture of the articular lip of the radius
3. Colles' fracture—supra-styloid fracture or its reverse, the Smith fracture.
4. Fracture of one or both bones—linear, simple, comminuted
5. Compound fractures in any area of one or both bones

In Children

1. Epiphyseal separation with or without comminution comparable to Colles', Styloid and Barton's in adults.
2. Green stick fracture of one or both bones
3. Complete fracture of one or both bones
4. Linear or so-called subperiosteal fractures of one or both bones
5. Compound fractures associated with any of these conditions

The etiology of the fractures under discussion is usually that of direct violence, blows or falls upon the forearm, such as shutting a door on a forearm, catching the forearm in a belt, or the hand in a revolving wheel. Indirect violence such as falls upon the hand, backfire of an automobile during the act of cranking, muscular action as in shoveling, or sudden effort to prevent falling, may result in a fracture.

Of all the fractures of the radius at the lower end, Colles' fracture is most common. It was described by Abraham Colles in 1814 as a fracture of about one inch of the wrist joint, involving the whole thickness of the lower shaft of the bone with backward displacement. Since the advent of x-ray many fractures of this type much nearer the joint are still known as Colles' fracture. Because of great disability to the hand and wrist in poorly reduced fractures, great care must be taken to restore: (1) the length of the radius; (2) the integrity of the radio-ulnar joint; and (3) the alignment of the radio-carpal joint.

1. The length of the radius can only be maintained by complete absolute breaking up of all impaction, because impacted bone dies and is absorbed.

2. The integrity of the radial ulnar joint is aided best by placing the radius and ulna in close apposition, that is, in full pronation.

3. Alignment of the radio-carpal joint depends upon complete elimination of all impaction and maintaining a moderate flexion and ulnar deviation of the wrist joint.

Impaction is the rule in Colles' fractures. Even though it is minimal, the amount of absorption may be considerable, and complete breaking and loosening of the fragments by traction and manipulation, regardless of the force required, is imperative.

Cotton, in his "Treatment of Fractures," contends the successful management of a Colles' fracture depends upon the maintaining of the integrity of the radial ulnar joint and would classify this fracture in two classes:

1. Fracture with the discus articularis intact
2. Fracture with the loss of the integrity of the radio-ulnar joint due to:
   (a) Rupture of the ligament itself
   (b) Avulsion of the ulnar styloid at its base
   (c) Severe comminution of the lower end of the radius with the ligament attached to a loose minor medial fragment

The normal relation of the radio-carpal joint is important in that the lower end of the radius should be in such position that flexion and extension of the wrist joint will be possible.

A method of procedure we have used for years with satisfaction has, as its object, reduction of

Read at the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, May 17, 1943.

impaction complete, regardless of force required, maintaining the closest possible contact of the radius and ulna. The proper alignment of the radial carpal joint is accomplished by the following procedure:

General anesthesia is used except when contraindicated.

The Jones manipulation is used. This consists of the handshake manipulation under strong traction, loosening the fragments completely. Then, with traction maintained, further moulding of fragments between thumb and fingers is accomplished. The hand is then held in full pronation, moderate but not forced flexion, with deviation of the hand to the ulnar side.

Deviation of the hand to the ulnar side is a comfortable position, and if the ulna has been properly restored to its dorsal position with flexion this maneuver wedges the lunate bone partly beneath the distal ulna preventing forward luxation. This gives stability to the ulnar side and a continuation of this position causes a pull on the carpal ligaments and radial fragments, lifting them into place, using the wedged ulna as a fulcrum. Continuance of ulnar deviation further serves to snug the radius to the ulna and permit reparative processes to reconstruct the ligamentary attachments. Traction is maintained by pull on the fingers and thumb by one, or better, two assistants, and the use of wire or fiber glove fingers makes strong traction easier.

One or two layers of sheet wadding or stockinette are applied and then a circular plaster-of-Paris cast from the base of the fingers to the elbow joint. The hand and fingers are covered to their tips with an Ace elastic bandage for the first twenty-four hours. A sling is used for the first few days and the patient is instructed to move his fingers. The plaster cast is carefully moulded while traction is maintained until the plaster is firm and set, not forgetting slight flexion and ulnar deviation. Check radiograms are taken to be sure of position directly after the application of the plaster-of-Paris cast. Personally, I do not bivalve the original cast but this can be done and the cast held in position by an elastic bandage, and it is advisable unless the cast is carefully moulded.

The position of the fragments is checked every ten days until the cast is removed in twenty-one to twenty-eight days after application. Upon removal of the plaster cast, a half cast or splint of heavy felt or metal is applied for a week or ten days with daily gentle manipulation of the wrist and fingers. An elastic bandage as a wrist support is then used until the function of the fingers and wrist has returned, which is usually about two months. It must be remembered that swollen fingers require active exercise and the retaining apparatus should in no way prevent such motion. Supportive elastic cloth bandage is valuable for the first twelve to twenty-four hours. The sling is discarded after a few days. Arm and shoulder movement is maintained by the exercise of dressing. Slight work can be carried out within a few days of the accident.

It is my belief that the procedure carried out in suprastyloid fractures (Colles') is proper for styloid fracture of the radius with quite extreme ulnar deviation and flexion to maintain reduction and position.

Styloid fractures of the ulna may occur singly or in connection with any of the mentioned fractures of the radius, and unless a large base is fractured, non-union is quite the rule, with usually no serious consequence if the discus articularis (triangular ligament) becomes stable.

Barton's fractures are essentially fractures into the joint with either lip of the radius broken off, the fragment being carried backward. The treatment is that of Colles' except that great force can be applied to push the fragment into position because the main portion of the lower end of the radius remains intact and over-correction is almost impossible.

Separation of the lower radial epiphysis in children is comparable to the Colles' and Barton's fractures in the adult. The lower radial epiphysis is usually displaced backward and outward and most frequently carries with it a fragment of the metaphysis. Through pull on the triangular and internal ligament of the wrist joint, the ulnar epiphysis may be separated and the styloid or lower end of the ulna fractured. The same manipulation is used as in a Colles' fracture, but in children when the fragments are reduced, they usually slip into near perfect position and are rather easily retained. The time of retention is only three weeks, and a splint, half cast, or circular cast will suffice. It must be remembered in epiphyseal separation that a premature fusion of the radial epiphysis takes place with resulting overgrowth of the ulna and dislocation of the radial ulnar joint.

Fracture of both bones of the forearm near the wrist joint may occur in adults and children alike and absolute reduction may present a difficult problem. Often when one bone is in satisfactory position, the other will assume a most unpromising position. In children with one shaft in satisfactory position and the other only partially reduced so that only the edge of the fragments touch or are not more than one-fourth on, the end result will be satisfactory provided proper alignment is kept up until union takes place. In adults this is not true as a large callus may prevent rotation, and the chance of cross union is more likely. This type of fracture is reduced by:

1. Manipulation and traction. Strong manipulation and traction will usually suffice in children and in most adults.

2. Traction according to Magnuson's method. Traction is made upon the hand and lower forearm, based upon principle that traction and counter traction will overcome muscle pull on the fragments and that they will fall into normal position. I believe this will be found to be true in children, but in adults this method is not always satisfactory.

3. Open operation or by direct leverage of fragments according to the Thompson method. Open operation with application of a fixing apparatus, such as a plate or on-lay bone graft on one or both bones is rarely necessary. Reduction by direct leverage by means of a curved small dental chisel as advocated by Thompson may obviate a major operation.

The method of retaining this type of fracture is quite different than in a Colles' fracture. Pronation should be eliminated, and the forearm is held in full supination to separate as far as possible the radius and ulna and the two sites of fracture. The retentive dressing must include the lower portion of the humerus so that pronation and supination cannot take place. A circular cast may be used, but the so-called sugar tong type of dressing is ideal.

Green stick and linear fractures of one or both bones are seen in children or in the early teen age and usually present no great difficulty in treatment. Green stick fractures, if they are of any extent, should be completely straightened. Most frequently it is necessary to complete the fracture to gain satisfactory reduction, but upon reduction only simple apparatus is necessary to retain position. Linear or subperiosteal fractures are usually seen without any great deformity and can be retained in the original good position by simple apparatus. Green stick and linear fractures usually heal slowly. They frequently require a much longer time for solid union to take place and therefore require splinting until definite evidence is seen in the radiogram of sufficient callus formation to warrant bony strength and resistance.

Compound fracture at the lower end of the radius and ulna is rarely seen except when the lower forearm has been caught in moving machinery, as between a belt and wheel or in definite crushing injuries. Usually injury to soft parts as well as to bone is extensive. In each and every instance complications may vary to such an extent that in this short paper it would be impossible to suggest any possible method of treatment. However, since the advent of the sulfa drugs, many cases can be best treated by the Orr method, often with primary healing of the wounds.

PATHOLOGIC CHANGES IN THE AURICLES IN AURICULAR FIBRILLATION ASSOCIATED WTH HYPERTENSION

LEE STOVER, M.D., and THOMAS J. DRY, M.D.
Rochester, Minnesota

EVER since the early years of this century, when it was recognized that absolute irregularity of the pulse is due to auricular fibrillation, sporadic attempts have been made to prove that definite pathologic changes in the auricles are the responsible factor. Most of these studies were confined largely to microscopic examination of the conduction system and of the myocardium, with occasional mention of the fact that the auricles were dilated. With the elaboration of

Abridgment of thesis submitted by Dr. Stover to the Faculty of the Graduate School of the University of Minnesota in partial fulfillment of the requirements for the degree of M.S. in Medicine.

Dr. Stover is a Fellow in Medicine, Mayo Foundation, and Dr. Dry is in the Section on Cardiology, The Mayo Clinic, Rochester, Minnesota.

the theory of "circus contraction" by Lewis in 1912, there came a realization that the condition is probably functional and that no definite pathologic change is necessary. Yater's exhaustive study of the conduction system in cases of auricular fibrillation further confirmed this belief.

However, a number of attempts have been made to correlate changes in the auricular wall with the presence of auricular fibrillation. The groups of hearts examined have nearly always included cases of auricular fibrillation associated with many different types of heart disease. It was thought to be of interest, therefore, to study the auricles of a group of cases of auricular fibrillation in which, so far as could be determined, the condition was associated only with hypertension, in order to determine the frequency of dilatation of the auricles, changes of the thickness of the auricular wall and the presence of any myocardial lesions.

Review of the Literature

The first recorded study of the pathologic changes in auricular fibrillation was made by Schönberg in 1909. He examined eleven hearts and found lymphocytic infiltration and fibrosis in the wall of the vena cava, the sulcus and the superior wall of the right auricle. He felt that there was a lesion in Wenckebach's bundle which acted similarly to a Stannius first ligature, and thought that this accounted for the arrhythmia. Similar findings were reported in 1910 by Hedinger and in 1909 by Koch. In the next four years, observations on small numbers of cases were made by Falconer and Dean[7,8] Price and MacKenzie, Cohn and Lewis, Draper, Berger, and Sutherland and Coombs. The majority of these hearts had dilated auricles as well as fibrosis and round cell infiltration of the auricular wall, particularly in the region of the sinus node.

In 1918, Frey reported the roentgenographic findings in ninety-nine cases of fibrillation, of which 72 per cent showed definite auricular enlargement. Brachman, in 1921, discussed 380 cases of auricular fibrillation of all types, an unstated number of which had come to necropsy. He stated that there was almost always definite myocardial change, usually fibrosis in the wall of the auricles. In 1922, Fløystrup reported the necropsy findings in twenty-six cases in twenty-three of which the auricles were dilated. In thirteen of these twenty-three there were valvular lesions. Fibrosis, round cell infiltration or fatty change was found in the auricular wall in 84.6 per cent of the cases. Mönckeberg, in 1924, in an extensive review of the literature, concluded that lesions in the sinus node or the myocardium were not necessary for the production of fibrillation.

In 1925, Frothingham found definite microscopic changes in nine out of eleven hearts which had fibrillated, and in four out of fifteen controls. These changes varied from mild differences in the staining reaction to actual necrosis of part or all of the fiber. He expressed the belief that there probably was some relation between auricular fibrillation and this degenerative lesion in the auricular muscle. Coombs and Herapath, as quoted by Cowan, found gross damage to the auricular muscle in all of the eighteen cases of auricular fibrillation which they examined.

Yater, in 1929, studied twenty-six hearts from cases of auricular fibrillation. In the six hearts in which hypertension was regarded as the cause of the arrhythmia there were changes which included swelling of the muscle fibers, loss of cross striations, slight thickening of the arterioles, and in one case, thickening of the endocardium of the left auricle. He stated that "the microscopic study of the hearts which had been the seat of these arrhythmias was strikingly negative as regards any distinctive lesion, or, in fact, as regards any changes which could be assigned as the cause of the arrhythmia in any individual case."

In a roentgenographic and postmortem study of ninety-six cases in 1934, Sussman and Woodruff found that auricular fibrillation of many years' duration may occur without auricular enlargement, and expressed the belief that the size of the left auricle was not directly related to the presence of fibrillation. In 1941, Hutcheson studied two cases of mitral stenosis with auricular fibrillation and twenty-seven controls. He found a great increase of the smooth muscle of the endocardium of the left auricle, in one instance an increase of sixty times, with a moderate decrease of the thickness of the auricular myocardium.

Methods

It was felt that there was no practicable method for the gross measurement of auricles which had been fixed in formalin, and it was therefore neces-

sary to determine the presence of dilatation by simple estimate. Each heart was examined on at least three separate occasions, and any auricle in which the enlargement could be considered only as slight was not considered to be dilated.

Two blocks of tissue were then cut from the left auricle and one block was cut from the right. One of these was taken from the left auricle at a point 1 cm. above the posterior leaflet of the mitral valve and one near the base of the left auricular appendage. The tissue from the right auricle was taken from its right wall, at the approximate center of the region occupied by the pectinate muscles. The tissue was embedded in paraffin and stained with hematoxylin and eosin, after which each section was examined microscopically. Each section was then placed in a microprojector, and the image, magnified fifty times, was projected onto graph paper, the heavy lines of which were 1 inch (2.54 cm.) apart. The thickness of the auricular myocardium and endocardium was then measured at each of these lines. Because of its extreme thinness, it was found to be impossible to measure the endocardium of the right auricle by this method.

The total number of measurements taken was 7,858. The minimal number of measurements of any component of the wall was eight and the maximal number thirty-one, with an average of twenty-one. The average measurement of each component was then determined, and divided by fifty to reduce it to the actual correct thickness, measured in millimeters.

Analysis of Cases

All cases in which there was any evidence of rheumatic fever at necropsy, or any previous history of the disease, were excluded from the study, as were also all cases in which the thyroid gland was abnormal in any respect. While it was impossible to exclude cases in which there was coronary sclerosis, there was definite associated hypertension in all instances. All instances of patent foramen ovale were omitted.

The upper limits of normal blood pressure were considered to be 145 mm. of mercury systolic and 90 diastolic. In four of the sixty-seven cases included in the groups in which there was hypertension the records did not show blood pressure readings greater than this level. However, all of these cases showed significant cardiac hypertrophy which could not be attributed to any other cause and in three of these there was a history of previous hypertension. In the group of cases in which there was auricular fibrillation, the presence of the arrhythmia was verified electrocardiographically. In the groups of cases in which there was hypertension but no fibrillation, electrocardiograms when taken showed no further evidence of an auricular conduction disturbance than an occasional auricular premature contraction.

The total number of hearts examined was ninety-two. These were divided into four groups. The first group contained twenty-one hearts from patients who had had hypertension and auricular fibrillation. In this group the ages at death varied from forty-one years to seventy-nine years, with an average of 61.9. There were thirteen men and eight women. In thirteen of these cases the approximate duration of the fibrillation was known and in eight it was unknown. In four of these thirteen, the fibrillation had been present for less than one month, and in the remaining nine it had been present for more than one month. This group included cases in which fibrillation had been present for some time, and in one instance the condition had been intermittently present for sixteen years. For purposes of study, the eight cases in which the duration of the fibrillation was unknown were arbitrarily placed in the group in which fibrillation had been present for less than one month.

The second group consisted of twenty-five normal hearts, in which so far as could be determined there was no evidence of gross or microscopic pathologic change. None of these patients had any history of hypertension, and the heart weights were within normal limits. In no case was coronary sclerosis graded as more than 2, on the basis of 1 to 4. The ages of the patients in this group varied from seventeen to seventy years, with an average of 45.6. There were ten men and fifteen women in this group. No effort was made to have the age group of these hearts coincide with the pathologic groups because it was thought advisable to have hearts of all ages for purposes of measurement and histologic study.

The third group comprised twenty-five hearts from patients who had had hypertension, without auricular fibrillation, and without congestive failure. The ages in this group varied from

TABLE I. AVERAGE MEASUREMENTS OF THE THICKNESS OF THE VARIOUS COMPONENTS OF THE AURICULAR WALL, NUMBER OF CASES IN WHICH MICROSCOPIC LESIONS AND AURICULAR DILATATION OCCURRED AND HEART WEIGHT

	Right auricle, mm.	Left auricle, mm.					
	Myocardium	Average, myocardium	Average, endocardium	Total thickness	Microscopic lesions	Auricular dilatation	Heart weight, gm.
Auricular fibrillation (21 cases)	1.59	1.81	0.32	2.13	11	15	528
Fibrillation and congestive failure (6 cases)	1.96	1.86	0.28	2.14	3	4	561
Fibrillation, no congestive failure (15 cases)	1.44	1.80	0.34	2.12	7	9	515
Hypertension, no fibrillation or failure (25 cases)	1.49	2.24	0.40	2.64	12	7	468
Hypertension with failure, no fibrillation (21 cases)	1.68	2.19	0.35	2.55	16	12	607
Auricular dilatation (34 cases)	1.64	2.21	0.36	2.58	21	34	581
No auricular dilatation (46 cases)	1.62	2.03	0.36	2.38	23	0	545
Fibrillation: duration one month or less (12 cases)	1.55	1.93	0.36	2.27	6	7	524
"Prolonged" fibrillators (9 cases)	1.64	1.67	0.27	1.93	5	8	533
Normal hearts (25 cases)	1.21	1.19	0.38	1.59	0	0	299

twenty-five to seventy-six years, with an average of 57.4. Of these patients, seventeen were men and eight were women.

The fourth group was made up of the hearts of twenty-one patients who had had hypertension and resultant congestive heart failure but no history of auricular fibrillation. The ages varied from forty-three to seventy-seven years, with an average age of 59.5 years. There were fourteen men and seven women in this group.

Findings

In analyzing the frequency of auricular dilatation in the sixty-seven cases of hypertensive heart disease under study, important factors to be considered include the presence of auricular fibrillation, the presence of congestive heart failure and the heart weight.

In fifteen of the twenty-one cases of fibrillation, auricular dilatation was present (71.4 per cent). In two cases the right auricle alone was dilated and in two cases the left auricle alone. In eleven cases both auricles were dilated.

Congestive heart failure was present in a total of twenty-eight cases. In eighteen of these (64.3 per cent) there was auricular dilatation. Seven of these twenty-eight cases also had had auricular fibrillation, and in six of the seven cases (85.7 per cent) there was auricular dilatation. Of the twenty-one cases of congestive failure in which fibrillation had not occurred, twelve exhibited auricular dilatation (57.1 per cent). The right auricle alone was considered to be dilated in three of these, and in one case the left auricle only was enlarged. In eight cases, both auricles were enlarged.

An effort was also made to determine whether the auricular dilatation was more frequent in hearts which had undergone marked hypertrophy than in those which had not. Thirty-three of the hearts studied weighed 500 gm. or more. Of these, twenty-six (78.8 per cent) exhibited dilated auricles. Of the thirty-four hearts weighing less than 500 gm., only nine (26.5 per cent) showed auricular dilatation.

Six of the hearts which had fibrillated but not failed weighed more than 500 gm. Four of these (66.7 per cent) had definite auricular dilatation.

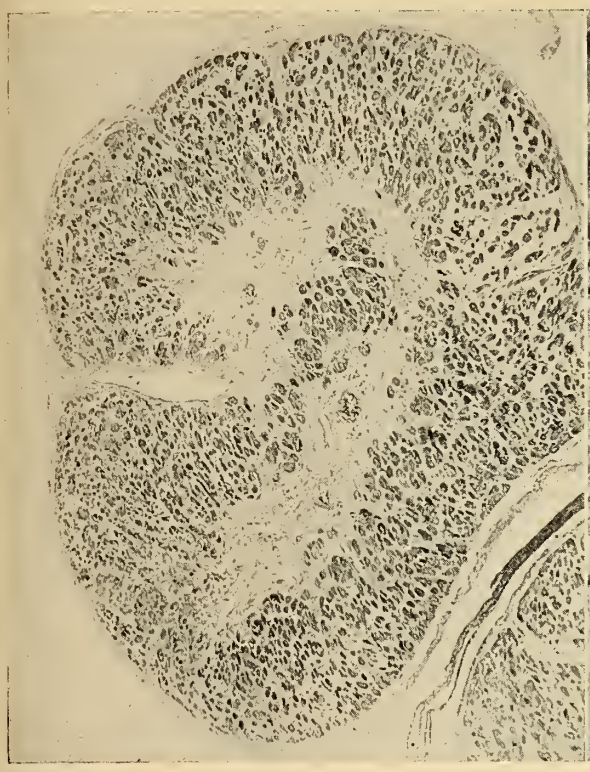


Fig. 1. A section from the wall of the right auricle in a case of auricular fibrillation of more than three years' duration, showing the typical myocardial degeneration and fibrosis (×60).

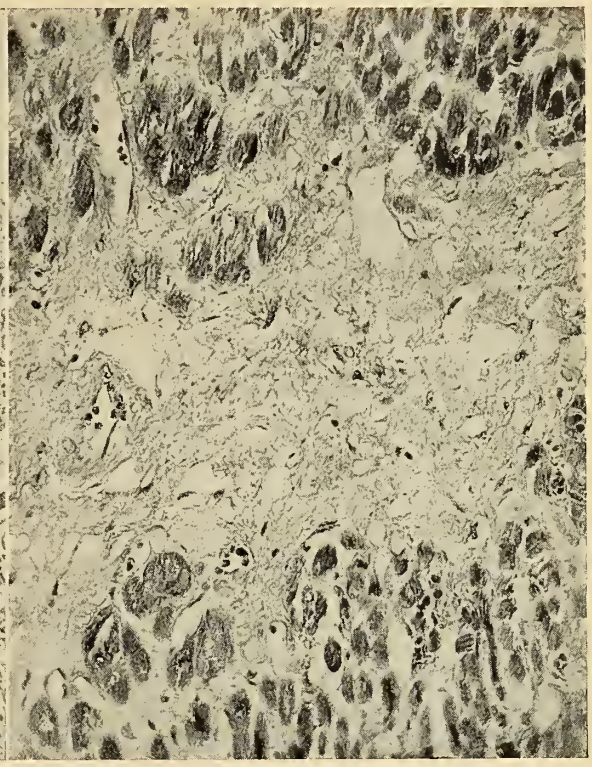


Fig. 2. A higher magnification of one of the fibrotic regions in Figure 1 (×225).

Of the eight fibrillating hearts without failure weighing less than 500 gm., five (62.5 per cent) also had auricular dilatation.

Of the twenty-five cases in which there was hypertension but no fibrillation or congestive failure, there was auricular dilatation in only seven (28 per cent). In three cases, the right auricle alone was dilated, in two the left alone, and in two cases both auricles were enlarged. Seven of these twenty-five hearts weighed more than 500 gm., and there were dilated auricles in four of these (57.1 per cent). Dilatation was present in only two of the eighteen hearts weighing less than 500 gm. (11.1 per cent).

Sixteen of the twenty-one hearts in which there had been congestive failure but no fibrillation weighed more than 500 gm. Twelve of these (75 per cent) had dilated auricles. There was no auricular dilatation in any of the five hearts in this group which weighed less than 500 gm.

The measurements of the thickness of the auricular wall in the various groups will be found in Table I. All measurements are expressed in millimeters. It will be noted that the difference of the mean thicknesses of the various components of the auricular wall in the different groups is in no case great. Small differences do exist, particularly in a comparison of the normal with the pathologic groups. Since the hearts in the latter groups weighed, on an average, from 150 to 300 gm. more than the average heart in the normal group, it would seem that these differences cannot be considered to be significant. The figures obtained in the pathologic groups showed surprisingly little variation, and, likewise, there was little difference between the average thicknesses in the group of auricular fibrillation, with and without dilatation. The duration of the fibrillation seemed to have no effect on the thickness of the various components of the auricular wall, as measured by this method.

There were definite histologic alterations of the auricular walls of a considerable number of the hearts examined, with the exception of the normal group, in which none were found. These lesions were similar to those described by Frothingham and by Yater, and consisted of degenerative changes in the myocardial fibers, varying from mild change with disruption or disappear-

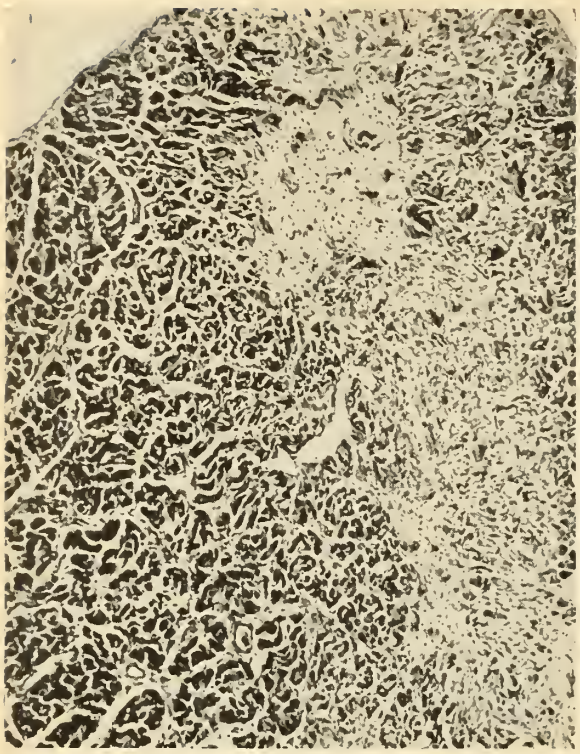


Fig. 3. A similar region of fibrosis in the right auricular wall in a case of hypertensive heart disease with congestive failure but without auricular fibrillation (×80).

ance of the cross striations to actual complete necrosis of part or all of the fiber. There was replacement of these damaged fibers by fine fibrous connective tissue. In some cases, there was also lymphocytic infiltration of moderate degree. These lesions of degeneration and fibrosis were most common in the region of the auricular wall immediately beneath the endocardium, a region which, theoretically, should have the richest blood supply (Figs. 1, 2 and 3). They were particularly common in the right auricle, in the tips of the pectinate muscles. These lesions were no more common in hearts in which there was severe coronary sclerosis than in those which exhibited minimal sclerosis of the coronary arteries. They occurred in the vicinity of blood vessels just as frequently as in regions where vessels were relatively few.

These lesions were present in all groups of the hearts from hypertensive patients. As will be seen from Table I, the lesions were present in eleven, or 52 per cent, of the hearts in which there had been auricular fibrillation. They occurred in nine of the fifteen hearts in the group with auricular fibrillation which had dilated auricles. They were present in about an equal proportion of the groups of auricular fibrillation with and without congestive heart failure.

These regions of degeneration also occurred in the auricles of twelve (48 per cent) of the group with hypertension but without congestive failure or auricular fibrillation. Seven of the hearts of this group had dilated auricles, and of these three, or 43 per cent, had microscopic changes.

Of the group in which there had been congestive heart failure but no auricular fibrillation, sixteen, or 76 per cent, contained microscopic lesions in the auricles. Twelve hearts from this group exhibited auricular dilatation, and nine of these (75 per cent) contained auricular lesions.

That the duration of the auricular fibrillation did not have any effect on the frequency of the lesions is shown from the fact that six of the twelve hearts which had fibrillated for one month or less contained lesions, whereas five of the nine hearts which had fibrillated for more than one month had regions of degeneration.

Summary and Conclusions

Auricular dilatation is slightly more common in cases of auricular fibrillation than in the other groups. It is also found frequently in hypertensive heart disease with congestive failure, but is relatively uncommon in cases of hypertensive heart disease in which there has been no history of auricular fibrillation or congestive failure. The heart weight had a definite bearing on the size of the auricles studied, and in all hearts weighing more than 500 gm. auricular dilatation was a very frequent finding. Dilatation of the auricles was uncommon in the hearts which weighed less than 500 gm., with the exception of those which had fibrillated. In this group, dilatation was almost as frequent as in the cases of auricular fibrillation which occurred in hearts weighing more than 500 gm.

Measurements of the auricular endocardium and myocardium, by the method described, failed to reveal any significant changes of the thickness of these two components of the auricular wall in the various types of hypertensive heart disease studied.

Degenerative lesions of the auricular myocardium are found frequently in cases of hypertensive heart disease, particularly in those groups in which there is auricular fibrillation or congestive heart failure.

There is nothing in this study to indicate that

the microscopic lesions described are in any way necessary to the development of auricular fibrillation or that they are the result of it.

References

1. Berger, V.: Anatomische Untersuchungen des Herzens bei Pulsus irregularis perpetuus. Deutsches Arch. f. klin. Med., 112:287-301, (Oct.) 1913.
2. Brachman, D. S.: Auricular fibrillation: some observations and deductions from a series of 400 cases. Lancet, 1:374-377, (Feb. 19) 1921.
3. Cohn, A. E., and Lewis, Thomas: Auricular fibrillation and complete heart block. A description of a case of Adams-Stokes' syndrome, including the postmortem examinations. Heart, 4:15-32, (Nov.) 1912.
4. Coombs, C. F., and Herapath, C. E. K.: Quoted by Cowan, John.
5. Cowan, John: The causes of auricular fibrillation. Quart. Jour. Med., 22:237-245, (Jan.) 1929.
6. Draper, G.: Pulsus irregularis perpetuus, with fibrosis of the sinus node. Heart, 3:13-22, (Oct.) 1911.
7. Falconer, A. W., and Dean, George: Observations on a case of heart-block associated with intermittent attacks of auricular fibrillation. Heart, 3:247-256, (June) 1912.
8. Falconer, A. W., and Dean, George: Observations on a case of auricular fibrillation with slow ventricular rate. Heart, 4:87-96, (Nov.) 1912.
9. Fløystrup, G.: Studies on the pathogenesis of auricular fibrillation. Acta med. Scandinav., 56:12-32, 1922.
10. Frey, Walter: Ueber Vorhofflimmern beim Menschen und seine Beseitigung durch Chinidin. Berl. klin. Wchnschr., 55:417-419, (May) 1918.
11. Frothingham, Channing: The auricles in cases of auricular fibrillation. Arch. Int. Med., 36:437-443, (Sept.) 1925.
12. Hedinger, Ernst: Über Herzbefunde bei Arrythmia perpetua. Frankfurt. Ztschr. f. Path., 5:296-321, 1910.
13. Hutcheson, W. C.: An anatomic basis for auricular fibrillation. Arch. Path., 31:369-372, (Mar.) 1941.
14. Koch: Ueber die Struktur des oberen Cavatrichters und seine Beziehungen zum Pulsus irregularis perpetuus. Deutsche med. Wchnschr., 35:429-432, (Mar.) 1909.
15. Mönckeberg, J. G.: Myokard und spezifisches Muskelsystem bei Allo- und Arthythmien des Herzens. In Henke, F., and Lubarsch, O.: Handbuch der speziellen Pathologischen Anatomie und Histologie. vol. 2, pp. 502-525. Berlin: Julius Springer, 1924.
16. Price, F. W., and MacKenzie, Ivy: Auricular fibrillation and heart-block in diphtheria. Heart, 3:233-242, (Feb.) 1912.
17. Schönberg, S.: Über Veränderungen im Sinusgebiet des Herzens bei chronischer Arrythmie. Frankfurt. Ztschr. f. Path., 2:153-179, 1909.
18. Sussman, M. L., and Woodruff, M. T.: The significance of left auricular dilatation in auricular fibrillation. Am. Jour. Roentgenol., 40:184-188, (Aug.) 1938.
19. Sutherland, G. A., and Coombs, C. F.: A case of acute rheumatic carditis and auricular fibrillation in a child. Heart, 5:15-20, (Oct.) 1913.
20. Yater, W. M.: Pathologic changes in auricular fibrillation and in allied arrhythmias. Arch. Int. Med., 43:808-834, (June) 1929.

MANAGEMENT OF INDUSTRIAL INJURIES

HENRY W. MEYERDING, M.D.

Rochester, Minnesota

DOUBTLESS many of us have witnessed a tremendous change in the management of industrial injuries in the past quarter of a century. There has been a vast improvement in the relationship between the employer and employe. The heads of modern industrial plants recognize they are definitely responsible for the welfare of their employes. Labor has found strength in organization and now insists on a healthful environment in which to work, on medical treatment and on compensation for injuries sustained. Thus, in an effort to satisfy employes and prevent prolonged expensive litigation, many industries have established first aid stations with hospital facilities, have employed company physicians, nurses and welfare workers, and have covered their employes with group accident and health insurance. After a time, compensation laws were passed and industry was made legally responsible in cases of industrial injuries and certain occupational disease. The day of simply replacing a worker when accident or disease causes disability and forcing him to care for himself has passed. This custom has given way to a more humane attitude. In this metamorphosis of the employer-employe relationship, the medical profession has taken an important part, and a new specialty has developed. Today, the industrial physician is no longer looked on merely as a company doctor but is appreciated and his group of specialties is a learned one.

The private physician now finds his paper work increasing and much of his time taken up with detailed reports to insurance companies, compensation boards, attorneys and other agencies. The management of industrial injuries demands that he take a careful history of the circumstances of the accident and record the physical findings, the diagnosis and the treatment employed, and that he obtain a satisfactory result with a minimal loss of time. Will his records stand inspection when he is called upon to produce them?

In my experience at the Mayo Clinic during the past thirty years I have encountered an increasing number of patients who came to the clinic because of an injury or disease which they attributed to factors that permit compensation benefits. In some instances the patient may have made the rounds of local physicians and some of the patients may have been seen by physicians of nationally known institutions or have consulted famous specialists and may still have been dis-

From the Section on Orthopedic Surgery, Mayo Clinic, Rochester, Minnesota.

Read before the Special Institute on Industrial Health, Iowa State Department of Health, Waterloo, Iowa, September 23, 1941.

satisfied with the diagnosis and opinion which have been given. Many of them seek a diagnosis and opinion that will permit them to collect compensation. The longer compensation is paid and the greater the amount received, the better satisfied the patient will be and the more cordial he will be to the physician. On the other hand, should the physician, after an honest and painstaking examination, express an adverse opinion and the patient fail to obtain financial benefits, another conclusion may be reached. Some dissatisfied patients who seek compensation vilify the doctor and refuse to compensate him for his conscientious work, and a common recourse is to threaten him with legal action. In rare instances, an angered patient has resorted to physical attack and even murder; two physicians of my acquaintance, who actually favored the petitioner's demands have been fatally shot by patients who thought that the physicians were responsible for their loss of compensation.

The relationship of the physician to the injured industrial worker is an important subject, the discussion of which would take more time than that allotted to me in this symposium. In my work, I have made it a practice to treat all patients alike. The injured industrial worker is given every courtesy and as complete an examination as does any other patient. I try to be friendly and get acquainted with him and take time to listen to his story. I record the salient facts in chronological order and make careful notes of the date and place of the accident and witnesses to it, of the previous care, of the name of the employer, and other possible facts that may be pertinent from a compensation-insurance angle. I ask the patient why he came to the clinic and who sent him, as his attending physician or an attorney often is responsible and desires a report of the findings following completion of our examination, which they hope may throw some light on a baffling situation. Before the physical examination has been started, I usually tell the patient that the findings may or may not help his claim and that any report that I make will give the honest facts and he must not expect anything else. Frequently the answer is, "Doctor, I came here because I want to get well and I do not expect anything that I am not entitled to." Thus, I have started with a definite understanding and usually have the cooperation of the patient during the rest of the examination. Naturally, one meets malingerers and mental types of patients. In spite of my best efforts I often find it difficult or impossible to satisfy such patients.

Following the general physical examination and the recording of the history and the physical findings, laboratory tests, including urinalysis and examination of the blood as indicated, are carried out. Frequently the patient's condition is such that further consultation with other specialists is required. In such instances it is advantageous to have consultants quickly available. The effect of such consultation impresses the industrial worker as he realizes that he is receiving an impartial examination. After he has been informed about his condition, the findings are sent to his physician and employer. Thus, when the findings are discussed with him he feels confident of the truthfulness of the diagnosis and the etiologic factors involved; no longer can he say the company surgeon was biased in his decision. After the summary of the findings and the rendering of an opinion which fails to meet the patient's desires, I frequently have been impressed by the friendly spirit with which he receives the decision. I believe that this is largely the result of the physician's attitude toward the patient; some physicians emanate a spirit of antagonism the moment a legal or compensation patient enters their presence and once the patient becomes aware of this he responds in a like manner with the result that both parties fail to come to an amicable understanding. The physician who wishes to carry on successful relations with the employer and employe must, above all things, maintain a reputation for honest, impartial and scientific practice.

In the majority of industrial accidents the employer demands that the physician give an opinion as to the extent of the patient's injuries. Insurance or compensation factors frequently may complicate the picture and require further correspondence or even necessitate legal hearings, all of which are time-consuming. Oftentimes that which appears unnecessary red tape to the physician is in reality of paramount importance to the employer, to the insurance company or to the compensation board. The physician who has a complete record of the case, including the history, physical findings, the treatment instituted and the result, usually has little difficulty in meeting the requirements or demands for infor-

mation in case of litigation. On the other hand, the physician who may have given the most skillful care and obtained a satisfactory result may be left open to criticism and embarrassment when his records prove to be inaccurate or inadequate. It is obvious that all histories should be filed by name and number so that they may be readily produced together with roentgenograms.

Employers who pay for the medical care of industrial patients have a right to the coöperation of the attending physician in that their employes receive skillful care and be returned to work within a reasonable healing period. In some instances the patient, after recovering from his initial fear and pain, may find his income from compensation, insurance and so forth, so satisfactory and his leisure so enjoyable that he tries to postpone the day of his return to work. Every physician has met this type of individual who intentionally or unintentionally becomes a malingerer. In some instances the patient may be influenced by well-meaning friends or attorneys, and the physician who encourages such action soon may lose the respect of all persons concerned and his practice may suffer as a result. When a patient begins to show evidence of intentionally prolonging his disability, it has been my practice to tell him frankly that he should return to his work and that he will gain more financially, mentally and physically by so doing. Compensation boards and juries usually decide favorably where there is reasonable doubt as to the disability of the industrial worker. This may account for an increase in the number of such cases seen during the past few years. The employer pays through insurance premiums for the employe's protection as provided by law; therefore, both the employer and the employe should be protected from needless litigation. Unless there is coöperation by both parties, litigation and increased premium rates would reach such a magnitude that the employer would be threatened with bankruptcy and the employe with loss of employment.

The physician's role, his records and his opinion obviously play a vital part in the settlement of all questions involving industrial injuries. When he does his part honorably and well he commands the respect of all parties concerned.

What are some of the important factors one must take into consideration in the treatment of industrial accidents? Time is probably the most important factor in the treatment of the wound as immediate and adequate care may prevent infection in the majority of cases. The injured person must report to his foreman at once. A sterile dressing should be applied to the wounds and medical care should be made available within an hour or two. Most wounds are contaminated at the start and early cleansing with large quantities of soap and water aided by cotton, gauze or brush, as the occasion demands, are all that is needed to obtain healing by primary intention or rapid granulation. I am not opposed to the use of antiseptics following the cleansing and drying of wounds; in fact, I frequently use them. I believe that soap and adequate irrigation are more important than the use of antiseptics. Too much stress is laid upon the application of antiseptics and not enough on thorough cleansing. Certain techniques advocated in the care of wounds have as their basis primary thorough cleansing. Soap and water are practically always available and easy to use. I am not condemning dakinization, Orr treatment or the use of sulfonamides as I frequently employ these excellent types of treatment when in my opinion I believe it is impossible to cleanse a wound thoroughly. In those cases in which crushed, soiled and devitalized tissue is present, thorough débridement should be carried out until living healthy tissue is reached. When in doubt, the wound should be left open and packed or drained by means of soft flat rubber drains, which prevent formation of pockets and clots. I prefer to use an alcohol dressing following suturing of a wound as it permits oozing along the suture line. The blood is absorbed deeply into the gauze and is less liable to cause irritation than in a mass of blood which accumulates and causes maceration. If the edges of the skin are soiled they should be excised; I feel that this region is frequently the point at which infection occurs. I use tincture of iodine or merthiolate in preparing the skin for operation and also for application to dried cleansed fresh wounds.

A recent report by Dr. H. S. Dolan, presented before the American Association for Surgery of Trauma, is of interest. He reported 3,400 cases in which puncture wounds of the foot were caused by nails while men had been cleaning out the bed of an old canal. None of these patients was given tetanus antitoxin and tetanus did not develop in any of the cases. Every injured man was sent to his foreman, who applied

a clean dry dressing to the wound and sent the injured man to the surgeon, who excised the skin edges, inserted iodine or some other antiseptic and applied a dry dressing. Dolan emphasized the fact that the nails had pushed in the skin and had sealed the wound so that the deep part could not drain. I have a personal communication from an industrial surgeon who said: "there are 8,000 to 10,000 accidental wounds in this plant during a year, which include quite a number of puncture wounds of the hands and feet, and we have not had a case of tetanus in twenty-five years; tetanus antitoxin is used only in cases of wounds sustained on the street, stable or where contamination by equine excreta is a possibility. We never use gas serum and I can only recall one case of gas infection which occurred in a rather serious injury some days after hospitalization." I believe that this is not an unusual experience among surgeons who have the opportunity of caring for wounds immediately. The cases I see are those in which the patients report for medical care hours or days following injury. In such cases infection has already taken place. It is too late to expect cleansing and débridement to prevent prolonged disability and it is necesary to resort to the use of antitoxin, sulfonamides and operative treatment. In cases in which infection is evident but not localized, I prefer to place the patient at rest in bed and apply, continuously, packs that have been soaked in a warm mixture of equal parts of 95 per cent alcohol and saturated solution of boric acid. A soft nutritious diet and an abundance of fluids are indicated. The sulfonamide drugs should be administered to the point of intolerance in cases of severe infection. As soon as the infection becomes localized, adequate drainage should be established. Sulfathiazole should be employed in cases of staphylococcic infection and sulfanilamide should be employed in cases of streptococcic infection.* In cases of septicemia in which the proper drug is administered in adequate doses, the recovery rate is now as high as 70 to 75 per cent. Regardless of whether wounds are or are not associated with fracture, the local application of the sulfonamide drugs has proved encouraging in the prophylactic and curative treatment of infection. Usually the wound is dusted with 7 gm. of dry powder or is irrigated with an 0.8 per cent solution.

*Penicillin has now proved invaluable in staphylococcic infections and septicemia.

Time will not permit a consideration of fractures but I would like to mention a few points in this connection. In all cases in which an injury of the bone is suspected, anteroposterior and lateral roentgenograms should be made. Each roentgenogram should be marked by a permanent method so that it will be possible at any time to determine with certainty (1) the date on which the roentgenogram was made, (2) the case number and name of the patient, (3) the situation of the bone, that is right or left, and (4) the name of the roentgenologist. Other roentgenograms should be made at various periods after reduction of the fracture. Such roentgenograms not only protect the surgeon but enable him to detect slipping of the fragments and the progress of union.

There is no substitute for surgical judgment. In each case of fracture one must consider the relative value of operative and nonoperative treatment. It can be said, however, that the majority of fractures can be treated successfully by conservative methods. Too much stress has been laid upon the postoperative roentgenologic appearance of fracture and not enough upon the functional result. The tendency to convert a closed fracture into an open one has in many instances resulted in a catastrophe and permanent disability. The mature surgeon, working in the best surgical hospital environment and endowed with natural skill, may obtain far better results than those obtained by a physician who attempts to operate in a less favorable environment. Whenever a closed fracture can be reduced properly and fixed without impairment of circulation (vascular supply) or nerves, it is wise to avoid open reduction. Operation should be employed for certain types of fractures. In certain cases one may anticipate difficulty of reduction and the development of complications. In such cases, undue periods of disability might arise if conservative treatment were employed.

A compound fracture should be cleansed with meticulous care. It is advisable to remove small loose fragments which have been displaced; then the fracture should be reduced. Unless the surgeon feels confident of the cleansing of the wound, it is advisable to apply sulfonamides, institute drainage, employ the Orr treatment or dakinization. It is essential that the injured parts should be placed at absolute rest following cleansing and débridement. I use plaster of Paris padded with gauze and sterilized wool bandage

and I usually immobilize the neighboring joints. Colles' fractures are usually splinted with a plaster dorsal splint, and the elbow and fingers are permitted to function. In the treatment of fractures of the neck of the femur the value of nailing has been definitely established and this is now recognized as the quickest and most efficient method of treatment. Fractures about the elbow require the constant attention of the physician and the nursing staff in order to prevent interference of circulation in the forearm and the dreaded complication of Volkmann's ischemic contracture.

In the limited time available, it is obviously impossible to consider many of the problems which confront the physician in the management of industrial injuries.

Summary

Good will and a definite understanding with the industrial worker will facilitate the management of industrial injuries. Accurate records are essential; these should be preserved and should be readily available at any time. Physical and laboratory examinations often lead to unrecognized conditions that have an important bearing on the healing period. The record of treatment carried out, its results, and a follow-up report, whenever possible, are of importance in determining the extent of disability and in settling claims for compensation. The coöperation of the employer, employe and physician is essential. The health of the industrial worker is more important than financial compensation.

A DEODORANT FOR COLOSTOMIES

W. C. CARROLL, M.D.
Saint Paul, Minnesota

TO the average individual faced with the prospects of a permanent colostomy, the greatest handicap usually proves to be the very disagreeable odor associated with it. Many become very adept in regulating their bowel movements, but the absence of a sphincter muscle leaves the individual unable to control the escaping gas, and at times, some of the fecal discharge. Various pads, cups, and belts have been tried, and while these tend to keep gross soiling to a minimum, nevertheless all these will of themselves in time become offensive, and also, they will not prevent the escape of malodorous gases.

To realize to what degree this may affect an individual, all that is necessary is to look up the record of those unfortunates who preferred death and, in fact, took their own lives, rather than face the future with a permanent colostomy. Some feel themselves social outcasts, and even members of their immediate family find it difficult to aid them, so that their lives must be entirely changed. It has been very difficult, if not impossible, for many to return to their former occupations.

In view of these facts, surgeons have endeavored to perfect their techniques in anastomosis in order to do away with some of the colostomies, and greater risks are taken to restore the normal intestinal continuity. This has led, perhaps, to an increase in the immediate surgical mortality.

However much more agreeable it may appear to the individual to have a sacral anus than one on the anterior abdominal wall, still the toilet of an abnormal anus is difficult. In either case, diets to constipate the patient so that it is only necessary to have a movement every other day are the most important, but the longer the fecal matter is retained, the more foul gas may be produced, and its uncontrollable escape presents a problem.

As a result of the foregoing, I interested Dr. W. J. Tomsicek, Chief of the Chemistry Department of St. Thomas College, in the hope that he might possibly be able to suggest some chemical which would counteract the odors coming from a colostomy.

He went to work on the problem with enthusiasm, and after considerable experimentation has developed a compound which can be given in a small capsule two to three times a day before meals, which does away with all the objectionable odors connected with colostomy. Since using these deodorant capsules at the hospital, we have been able to place these colostomy patients in

a two- or four-bed ward without embarrassing any member in the room. Having tried these capsules on patients who are ambulatory and attempting to work in spite of their handicap, they can well attest to the value of the compound. After taking these capsules for a time, and being able to carry on their duties as salesman, stenographer, or housewife, we have had them discontinue the medicine for a while. It was not long before every one insisted upon returning to the capsules. A noticeable effect was apparent in the homes where the various members of the family were able to return to a more normal life. Apologies for the odors were unnecessary.

Its value does not stop there. It has been used in cases of extreme flatulence with excellent results, as the gas that was passed was odorless. This fact should offer further possibilities for the use of this material for patients in ward beds, as anyone who ever cared for patients in a room of two or more beds can testify that anything to reduce fecal odors would be more than welcome.

This substance is not absorbed from the intestinal tract, and has had no deleterious effect upon any of the patients who have used it. Its simplicity and thorough effectiveness make it a most valuable adjunct in the postoperative treatment of the unfortunate patient who is forced to live with a colostomy.

The compound used consists of an especially selected, treated, and activated carbon, 90 per cent, plus phenylsalicylate, 10 per cent. It is put up in sealed enteric-coated capsules to prevent action by the stomach secretions which would nullify its effectiveness. Its action is by adsorption.

TRAUMA OF THE SPLEEN

JOHN M. CULLIGAN, M.D. and D. JACK SOLTMAN, M.D.
Saint Paul, Minnesota

INJURIES to the abdomen result in trauma to the spleen much more frequently than is commonly supposed. In reviewing the literature, we have found the incidence to vary from 20 per cent to nearly 50 per cent of all injuries to abdominal organs. Robitshek, quoting Berger, says that 20 per cent of cases of injury to abdominal viscera showed rupture of the spleen. Harris quotes Mazel to the effect that 30 per cent of all abdominal injuries show splenic trauma. Experience and clinical judgment are required to make a diagnosis, for frequently where the injury seems to be minimal, rupture of the spleen will be found to be present. Awareness of this possibility coupled with close observation of the patient for a period of a few hours may be of invaluable assistance in guiding one's procedure.

In checking our files and those of the Ancker Hospital for the years since 1933, we have found eighteen cases requiring splenectomy for trauma to the spleen. Of these, fourteen were nonperforating injuries while four were perforating wounds of the abdomen. In the first group of fourteen cases there were three deaths, two of which occurred with complications other than splenic rupture, a mortality of 21 per cent. One patient (Case 10) was severely crushed in a cave-in, dying upon the second postoperative day. Another (Case 11) died upon the thirty-sixth postoperative day and was found at autopsy to have typhoid fever, though stools and blood cultures had been negative before death. In the second group of four cases (all gunshot wounds) there was one death, a mortality of 25 per cent. This death was in a twenty-five-year-old man who had forty-two perforations of the bowel, with lacerations of the diaphragm and kidney. He developed bronchopneumonia and died upon the seventeenth postoperative day. The total mortality for the eighteen cases was 22.2 per cent.

There were three cases in which there were associated perforating wounds of the gastro-intestinal tract. The wounds in two were due to gunshot wounds and one was received in an automobile accident. In this group there was perforation in one case each of the stomach, small bowel and colon. Only the patient with perforation of the colon died. The one with the perforated stomach made a slow recovery complicated by pneumonia and pleural effusion, while the one

Presented before the Saint Paul Surgical Society, Saint Paul, Minnesota, October 8, 1942.

with the perforation of the small bowel made an uneventful recovery. The mortality in this group was one in three or 33 per cent.

The mortality in the uncomplicated cases was one in nine or 11 per cent while that of the complicated group was three in nine or 33 per cent. In a report from the clinic of Rousselot and Illyne there was no mortality in the uncomplicated cases as compared to 62.5 per cent in the complicated.

Etiology

Most recent articles on this subject show automobile accidents to be the greatest single cause of trauma to the spleen, with the greatest age incidence in the group from eleven to twenty, males predominating. This series is no exception. Car accidents accounted for 39 per cent of the series, while other blunt injuries such as falls, sliding and coasting accidents accounted for 33 per cent. Gunshot and crushing wounds made up the rest. Eleven cases or 60 per cent were in the age group from eleven to twenty, while twelve of the individuals (67 per cent) were males.

Pathology

McIndoe, in 1923, classified splenic trauma into three groups according to the severity of injury, and to this a fourth has been added by various authors. These consist of the following: (1) minor capsular tear with contusion of the pulp; (2) intrasplenic and subcapsular hematomata without capsular rupture; (3) deep pulp and capsular rupture with perisplenic hematomata; (4) complete severance of the splenic pedicle. Examples of the first group are seldom recognized as operation is usually not required. We had one case which probably belongs to this group. Likewise group two is seldom seen, though it is this group, along with the encapsulated perisplenic hematomata of group three, that may account for the so-called "delayed hemorrhage." In group three belong the majority of cases (thirteen of ours). Group four is rare: Blocker[2] in 1939 collected seven such cases from the literature and reported one of his own. We had none in this group. In sixteen of our cases there was associated hemoperitoneum.

Not fitting well into any one of these groups were our cases of gunshot wounds. While two of these patients had lacerations of the pulp and capsule with free bleeding into the peritoneal cavity, and so could, perhaps, have been put into group 3, two of them had perforation of the splenic substance and capsule with no bleeding. In general, gunshot wounds are probably best classified under group 3.

Symptoms and Signs

The history of a blow or gunshot wound is usually given. Unconsciousness is rare and, if present, is probably due to something other than the trauma to the spleen. Following the blow the patient complains of severe, generalized abdominal pain. Shortly afterwards this tends to localize upon the left side, though frequently somewhat below the region of the spleen. Occasionally vomiting may follow, but we had no case in which hematemesis was noted. There appears to be some disagreement among various authors as to the frequency of associated shoulder pain (Kehr's sign). It was recorded in one-third of our cases, and Anderson, in a series of ten cases in children, found it in 50 per cent. Since it may not come on until three to four hours after the accident, and since the patient may not offer the information spontaneously because of the relatively much greater abdominal pain, we feel that it may have been missed in some of our cases. It is a quite significant symptom and should be inquired about in any suspected case.

Upon examination a certain degree of shock is noted. A peculiar yellowish color, much like a patient with generalized carcinomatosis, may be present. There is a worried expression. Blood pressure is normal to low, pulse increased to 120 to 150, and temperature 99 to 101 degrees. One of the most constant signs is rapidity of respiration, frequently with pain upon inspiration. Generalized abdominal tenderness and rigidity, but most marked upon the left side, is present. Rebound tenderness may be elicited. Fixed dullness in the left upper quadrant (Ballance's sign) was found in but two of our patients but probably was not looked for routinely. Microscopic hematuria was seen frequently, but gross blood in only three instances. Of these, all but one showed kidney damage at operation, sufficient to justify removal. One patient who, at operation, was found to have a perforated kidney, did not have even microscopic blood in the urine.

Following the initial examination when rupture of the spleen is suspected, the patient must

be observed closely. A white count and hemoglobin is done immediately and repeated every thirty to sixty minutes. Hemoglobin may be normal or even high, early, but as the shock of hemorrhage replaces the traumatic shock it gradually falls. Harris has recommended the determination of the specific gravity of the blood to ascertain the degree of shock and hemorrhage, believing it is much more sensitive than hemoglobin and red blood counts. The white blood count may also be normal or but slightly elevated at first, but as bleeding increases it rises to 20,000 or 25,000. A flat plate of the abdomen may be of assistance. Air under the diaphragm, increased density in the left upper quadrant, elevation of the left leaf of the diaphragm or displacement of the stomach to the right by blood clots in the peritoneal cavity, may be noted. To aid in confirmation of the diagnosis Wright and Prigot have used the abdominal tap for presence of blood. In their hands it has been very helpful as well as reliable.

Blood pressure, pulse and temperature should be checked every fifteen minutes; the abdomen examined frequently. Should all findings become stabilized or recede, the patient may be sent to the surgical floor for observation. Criteria for surgical exploration are increasing shock as manifested by falling blood pressure and rising pulse rate, falling hemoglobin with a rising white count, and increasing abdominal tenderness and rigidity. Of course, with gunshot wounds the direction of the bullet or shot will affect the indications for operation, but the maxim for guidance in perforating wounds should be, "when in doubt, explore."

Perhaps, at this point, some mention should be made of the so-called "delayed hemorrhage" or "two-stage rupture" as it is known in foreign literature. McIndoe in 1932 collected forty-five of these cases from the literature and added one of his own. Webb collected twelve more up to 1939 and added one of his own. Since then several more cases have been reported. Following an injury to the spleen Baudet described a latent period during which the patient is relatively asymptomatic. This latent period may last anywhere from a few minutes to several hours before the patient begins to have signs of bleeding. McIndoe arbitrarily set the limit of this "latent period of Baudet" at forty-eight hours; any case developing signs of bleeding after this forty-eight-hour period is classified as a "delayed hemorrhage." The pathology here is thought to be a subcapsular or encapsulated hematoma which subsequently ruptures. The patient has the history of a blow, frequently very minor, with perhaps a slight amount of pain at the time. After a few hours in bed he may feel well enough to continue with his daily activity. Then, in a few days, during some slight strain, he develops suddenly the signs and symptoms of intra-abdominal hemorrhage. This secondary rupture usually occurs between the third and ninth day, but in one reported case it was delayed as long as six months.

Case Reports

Two in our series were cases of delayed hemorrhage:

Case 6.—A thirteen-year-old girl was hit just below the left costal margin by the handle-bars of a bicycle. She had some pain in the left flank with nausea at the time, but was able to attend school the next day and for the rest of the week. Pain was present in the left side only upon twisting her body or breathing deeply. During the night of the fifth day following the accident she was awakened by a severe pain in her left side, constant and worse upon breathing. She was brought to the hospital where she was found to have considerable tenderness in the left upper quadrant and left flank, with rigidity of the entire abdomen, most pronounced in the left upper quadrant. There was a moderate amount of distention. The hemoglobin was 48 per cent and shortly later 42 per cent. She was operated upon and a subcapsular hemorrhage and hematoma found with free bleeding into the peritoneal cavity. Recovery was uneventful.

Case 11.—A young man, aged twenty, while playing basketball ten days prior to admission, was hit in the left side of the abdomen by the head of another player. For the next five days he had considerable malaise, tenderness around his umbilicus, and pain upon respiration. On the sixth day he felt fairly well and went to work, but on the following two days had a recurrence of the pain which necessitated his staying in bed. Again on the ninth day he returned to work but while there developed profuse sweating, dizziness, and nausea and vomiting. He was brought to the hospital where examination of the abdomen showed diffuse tenderness with moderate rigidity. Blood pressure was 95/54. The hemoglobin was 68 per cent, red blood count 3,520,000, and the white blood count 13,200. At operation the spleen was ruptured and markedly enlarged. Pathological examination did not disclose the reason for the splenomegaly, but the pathologists suggested a blood dyscrasia or some such severe infection as bacterial endocarditis. Blood studies and cultures, stool cultures, and agglutination tests were all negative.

After a very stormy course during which he developed bronchopneumonia with pleural effusion, subphrenic abscess, and evisceration of his wound, he died upon the thirty-sixth postoperative day. Autopsy showed areas of ulceration corresponding to the location of Peyer's patches, and the microscopic picture was compatible with a diagnosis of typhoid fever.

Treatment

It has been shown that in nonsurgically treated cases of ruptured spleen the mortality is 90 to 95 per cent. Surgically treated, most reports give a mortality of 25 to 40 per cent for nonperforating wounds, with an average of about 30 per cent. For perforating wounds the mortality is almost twice as great or around 60 per cent. As to procedure, most surgeons consider splenectomy the only advisable operation. Foster and Prey suggest that some gunshot wounds may be amenable to suture, and that for the very critical patient tamponade is acceptable. In all individuals in our series splenectomy was performed.

Preoperatively a transfusion may be imperative. Where the operator is quite certain of the diagnosis the spleen is exposed very well by a transverse incision; however, for the general abdominal exploration the left rectus incision is preferable in that it allows examination of the rest of the abdominal contents more easily. The spleen is removed, care being taken to avoid the tail of the pancreas, and the pedicle doubly ligated. Clots are removed from the abdominal cavity and any free blood may very advantageously be used for an autotransfusion. The abdomen is closed without drainage. Postoperatively transfusions are given as indicated. Otherwise the care is much the same as for any other upper abdominal operation. Excluding those patients who died and two who were transferred to other hospitals before complete recovery, the average postoperative hospital stay for those who had a nonperforating wound was twenty-one days with extremes at eleven and thirty. For those with perforating wounds the average was 29.3 days with extremes of eleven and forty-eight. The total average hospital stay was 23.5 days.

Complications

Foster and Prey call attention to the high incidence of wound disruption and intestinal obstruction following splenectomy. A report from the clinic of Rousselot and Illyne found postoperative shock, atelectasis and wound infection to be the most common complication.

Six of our patients developed postoperative complications, some having more than one, with order of frequency as follows:

Bronchopneumonia with pleural effusion	4
Evisceration (both died)	2
Subphrenic abscess	2
Postoperative shock with death	1
Slough of wound—died	1
Minor wound infection	1
Abdominal adhesions	1

Summary

We have presented eighteen cases of splenectomy performed for rupture of the spleen. While realizing that such a small series presents no opportunity for generalizations, we have divided the cases in various ways, so comparing the mortality of those with abdominal perforation to those without; of those with perforation of the gastrointestinal tract to those without; and those with other complications than rupture of the spleen. Two cases of delayed hemorrhage were briefly presented. Symptoms and signs, criteria for exploration and treatment are discussed.

SUBSTANCE IN LIVER GOOD FOR SHOCK DUE TO BURNS

A substance in liver, and in some commercial liver extracts used for treatment of pernicious anemia, is effective in fighting shock due to burns, Dr. Myron Prinzmetal, Dr. Oscar Hechter, Dr. Clara Margoles and George Feigen, of the Cedars of Lebanon Hospital and the University of Southern California, discovered in experiments with rats *(Journal, American Medical Association,* July 10).

The antishock substance in liver is not the same as the anti-anemia principle. Efforts are now being made to isolate it.

War workers whose jobs require "difficult muscular effort" and who cannot because of local food and eating place conditions obtain adequate diets should be given doses of the vitamin B complex to keep up their strength and work output, it appears from the report of studies at Northwestern University Medical School by Dr. Clifford J. Barborka, Dr. Eliot E. Foltz and Dr. Andrew C. Ivy, who is now on leave serving as scientific director of the Naval Medical Research Institute, Bethesda, Md.—*Science News Letter,* July 17, 1943.

CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL

A. J. Hertzog, M.D., and S. V. Lofsness, M.D.
Pathologists

Presentation of a Case
A-43-1049

Dr. Arthur: This is the case of a twenty-eight-year-old man who was admitted to the Medical service on May 29, 1943. He expired two days later. His illness began one year previously when he began to suffer from severe diarrhea which grew progressively worse. He worked most of the time but occasionally had to go to bed because of weakness. Some days he had as many as thirty bowel movements and noticed mucus and small amounts of bright red blood in his stools. About eight weeks prior to admission, he complained of extreme malaise and anorexia in addition to the diarrhea. In April of this year, he was admitted to a private hospital for a complete work-up. His temperature varied from 98 to 100 degrees. General physical examination was negative except that an enlargement of his liver was noted. A proctoscopic examination was done and reported to be negative. However, the examiner said that the colon was not prepared and that the examination was not entirely satisfactory. X-rays of his chest and a gastro-intestinal x-ray study were reported as negative. The hemoglobin was 81 per cent. Agglutination tests were all negative except a one to twenty agglutination for Proteus X19. Stool examinations were positive for pus and blood. A technician in the private hospital reported on April 24 that organisms in the stool were found that resembled Endameba histolitica. A diagnosis of amoebic dysentery was made. He was treated with emetin hydrochloride with no appreciable improvement. On returning home, he grew weaker and the diarrhea persisted. There was considerable pain over the lower abdomen that was aggravated by bowel movements.

Physical examination on admission here showed him to be acutely ill. The blood pressure was 98/80; pulse rate 80; and temperature 99 degrees. There were moist râles over both lungs posteriorly. The heart was negative. There was extreme tenderness over the entire abdomen. The liver was greatly enlarged; it extended to the umbilicus and was extremely tender. Rectal examination revealed a large mass in the lower rectum. It could be felt easily by the examining finger. It was hard and fixed to the surrounding tissues. Hemoglobin was 88 per cent; leukocyte count was 24,850 with 83 per cent neutrophiles. Urinalysis was negative except for an occasional cast and pus cell. An examination of a fresh liquid stool was negative for amebæ. On the day after admission, his pulse and blood pressure became unobtainable. He was given plasma transfusions but expired approximately 48 hours after admission. The clinical diagnosis, based largely on the history obtained from the private hospital, was amebic dysentery with abscesses of the liver. It was thought that he may have had a terminal peritonitis.

Dr. A. T. Stenstrom: X-rays of his chest show a slight generalized cardiac enlargement involving both the right and left sides of the heart. There is some infiltration in the right costophrenic angle which looks like pneumonia. There is also some increase in the markings in the left base. A plate of his abdomen taken in the upright position shows no evidence of gas under the diaphragm, as one would expect if there were a perforated viscus. There is a large shadow taking up almost the entire abdomen that looks very much like a tremendously enlarged liver.

Dr. Hertzog: Do we all accept the diagnosis of amebic dysentery with multiple abscesses of the liver?

Dr. Walch: The diagnosis was made elsewhere. We first saw him shortly before he died. The single stool examination done here was negative for amebæ. The large rectal mass found on examination could be an amebic granuloma.

Student:
What is the significance of the positive agglutination of one to twenty with Proteus X19?

Dr. Hertzog: This is the Felix-Weil reaction. In a high dilution, a positive agglutination test with a strain of Proteus X19 organism is helpful in the diagnosis of typhus fever and Rocky Mountain Spotted fever. However, a positive agglutination at a one to twenty dilution is a frequent finding in routine examinations and has no significance. Did the technician elsewhere describe what she saw when she reported the stool positive for Endameba histolitica?

Dr. Lofsness: No, she reported that she found organisms resembling Endameba histolitica, without specifying whether they were motile forms or cysts.

Dr. Hertzog: The laboratory diagnosis of amebiasis is not always easy. There are many chances for error. It is much easier to recognize the motile trophozoites than the cysts. The motile forms are usually found only in semi-fluid or liquid stools. There are no less than five species of amebæ capable of living in the intestinal tract of man and only one of these, Endameba histolitica, is pathogenic. Hence, the laboratory worker is always confronted with the problem of differentiating between the various types of amebæ, particularly the common non-pathogenic Endameba coli.

Autopsy Findings

Dr. Arthur: The body was somewhat emaciated. The abdominal cavity contained approximately 100 c.c.

of clear, straw-colored fluid. There was no evidence of any perforation or peritonitis. The liver edge extended 12 cm. below the right costal margin. The pleural cavities each contained approximately 2,500 c.c. of clear fluid. The heart weighed 490 grams and appeared markedly dilated without any appreciable hypertrophy. The right lung weighed 920 grams, and the left 940 grams. They were both markedly edematous. The spleen weighed 180 grams and appeared normal. The liver was greatly enlarged; it weighed 4,790 grams and contained multiple large, solid, greyish-white tumor masses. The largest measured 8 cm. in diameter. They had the typical gross appearance of metastatic carcinoma. The rectum contained a large, necrotic ulcerated carcinoma, 6 cm. in diameter. It was adherent to the surrounding structures. The colon showed no evidence of ulcerative colitis.

Dr. Lofsness: This section is from the rectum. It shows an adenocarcinoma invading the wall of the rectum. The overlying mucosa has been destroyed. There is some tendency on the part of the rapidly growing epithelial cells to form glands. Sections of the colon show only a few leukocytes in the mucosa. There are no amebæ. The liver shows widespread metastatic carcinoma.

Dr. Hertzog: Most carcinomas of the rectum can be readily palpated with the examining finger. It is well to keep in mind the inability to recognize carcinoma of the rectum by colon x-ray studies, as the bones of the pelvis obscure the lower rectum.

Dr. A. T. Stenstrom: The roentgenologist does not attempt to diagnose carcinoma of the rectum by x-ray. They are extremely difficult to visualize, even when one knows a carcinoma is actually present.

Dr. Lofsness: Carcinoma of the rectum in men 28 years of age are rare, but they occasionally do occur. In a series of over 2,000 cases, Rankin and Comfort reported that the incidence of carcinoma of the rectum in persons thirty years old or less was 3.85 per cent of the total.

Anatomical Diagnosis: (1) Carcinoma of rectum with metastasis to liver. (2) Edema of lungs. (3) Bilateral hydrothorax.

CASE REPORT

ROCKY MOUNTAIN SPOTTED FEVER

H. R. TREGILGAS, M.D.
South Saint Paul, Minnesota

At least two rickettsial diseases, Rocky Mountain spotted fever and typhus fever, are of extreme interest at this time. Rocky Mountain spotted fever, also called tick bite fever, is no longer limited to the mountain states, but is prevalent in many sections, particularly along our eastern seaboard. Diseases having similar clinical syndromes and serological characteristics have been reported from several areas throughout the world.

Typhus has assumed an increased significance because of the present military conflict. None can forget the terrible epidemics of the last war, when during a six months' period, 150,000 persons died in southeastern Europe as the result of this disease. Today, typhus has spread through opposing armies and civilian populations, and prophylaxis is, therefore, of paramount importance.

The seasonal incidence and geographic distribution of the two diseases are dependent on the life cycle of the vector and its occurrence in nature. Spotted fever, which is transmitted by ticks, occurs in the spring and summer. Louse-borne typhus is most likely to be epidemic during the winter in cold climates when hygienic standards of living are low. Flea-borne, or murine typhus, which is confined to the more temperate climates, is apt to appear at any time of the year, summer being the most favorable season for small epidemics.

Dr. Howard Taylor Ricketts, formerly pathologist from the University of Pennsylvania, while working, in 1909, on the experimental transmission of Rocky Mountain spotted fever to animals, was the first to observe and describe small microörganisms, in the blood of infected animals, and in the tissues of ticks, which differed morphologically from other known species of bacteria. In 1910 he died of typhus fever contracted in Mexico during the course of his investigation of the disease. Later workers paid tribute to his memory by giving the name Rickettsia to this genus of infectious agents.

The rickettsial diseases are divided into three main groups:

1. *Rocky Mountain spotted fever* was so named because of its occurrence in the Bitter Root Valley district, where the disease had always been more severe, with an 80 per cent mortality. In the Brazil area where the disease is called Sao Paula Disease the mortality is 70 per cent. In the Mediterranean countries it is called Mediterranean Fever, with a more mild course and a lower mortality, running about 10 or 15 per cent. Another area of the disease is in South Africa.

2. *Typhus,* with a higher mortality.

3. *Japanese River fever,* which has a varying mortality.

Rocky Mountain spotted fever is carried by three kinds of ticks:

1, The Rocky Mountain wood tick. The disease spread by this insect has an 80 per cent mortality.

2. The common dog tick is the vector of most of the cases in the central and southern parts of the United States. The mortality is 20 to 30 per cent.

3. The rabbit tick is the cause of most cases in eastern parts of the United States where the mortality is 6 to 10 per cent. Dr. Robert Green of the University of Minnesota has done considerable work on the rabbit tick. He has found that only 3 or 4 per cent of ticks on rabbits are infected. Also Dr. R. R. Parker of the U. S. Laboratory in Hamilton, Montana, found the same percentage of tick infection.

Dr. R. R. Parker of the Montana laboratory has done extensive work with the ticks in that region. In collecting them, they fasten a blanket to a board and pull it behind a horse, through the weeds, and when it is turned over, it is literally covered with thousands of these wood ticks. Each tick is then examined individually for this infecting organism. Likewise several thousand ticks have been removed from one animal and each one examined separately to get the percentage of infected ticks.

In many cases the tick is first discovered by the individual on the back of the neck where after crawling up the clothing it first reaches the skin.

Dr. R. R. Parker has found that the tick feeds for several hours on the person before giving off the infected material, so that if the person is conscious of being bitten, he may not be infected if the tick is removed in time. The Rickettsia is a virus the size of which is said to be somewhere between that of bacteria and the filtrable viruses. It only grows in the living tissue and its best culture medium is the living egg embryo. This is used for the preparation of vaccine for prophylactic treatment.

Symptoms.—The incubation period in man is from two to five days in severe cases, and three to fourteen days in mild cases. There may be a distinct chill, marked malaise, sweating and pronounced headaches. Photophobia, pain in the upper part of the abdomen, and pain in the bones and muscles are rarely absent. Hemorrhages, nausea and vomiting may also be present. Eyes may appear dull and inflamed. The severity of symptoms increases rapidly in more severe cases. The pain in the muscles and bones may diminish with the appearance of the rash on the fifth to seventh day. The spleen is enlarged by the third day. Edema may be present in the extremities and on the face.

The rash developed first on the ankles, wrists and forehead and spreads over the body. The spots begin as bright rose spots, commonly macular and sometimes papular, about as large as the end of the finger. They finally cover most of the body including the palms and soles. Usually they are less marked on the abdomen. The color at first disappears on pressure and the more scattered the spots, the more color that remains on pressure, and the slower the infection progresses, the better is the prognosis. Small pinhead spots that rapidly become dark and hemorrhagic and confluent, indicate a more severe infection. The average febrile period is from two to three weeks. In nonfatal cases the pulse seldom exceeds 90, but in severe fatal cases, the pulse becomes shallow and may range from 110 to 160. A pulse over 150 and a temperature over 104 degrees are usually significant of a fatal case.

High pulse and fever soon after the onset are also unfavorable signs. Patients usually remain mentally clear even in fatal cases up to the last. There may be an ankle clonus and a positive Babinski sign. A slight rigidity of the neck is not uncommon. Vomiting is most common during the first few days, but may occur later. Jaundice is not uncommon and in some fatal attacks is a marked terminal condition. There is no significant pathologic change in the blood except the Weil-Felix proteus reaction which is positive after ten days.

Diagnosis.—Diagnosis is based on history, clinical findings, Weil-Felix proteus test and the typical rash. Rocky Mountain spotted fever is often confused with typhoid, measles, scarlet fever, smallpox, post-measles encephalitis, purpura hemorrhagica, epidemic cerebrospinal meningitis, secondary syphilis, Colorado tick fever and endemic typhus. Nonspecific reactions that sometimes follow tick bites may simulate the onset of spotted fever, but such reactions subside rapidly after the removal of the tick.

Treatment—Treatment is symptomatic. Codeine probably is the best drug. Serum obtained from immunized rabbits has been used with various results.

Prophylaxis.—Control of the tick carriers of Rocky Mountain spotted fever has not proved feasible. The most important protective measures are to avoid tick bites by wearing suitable clothing and the early removal of ticks. High boots are very important because ticks usually transfer from vegetation to the clothing at a height of less than 18 inches from the ground. They then crawl up the outside surface of the clothing.

Women who go into tick-infested areas should always wear men's attire and high boots and examine body frequently for ticks. Ticks seldom attach at once, and, since they but rarely transfer infection until they have fed for several hours, examination made twice a day, at noon and on retiring, is usually sufficient. In particularly dangerous areas, however, more frequent examinations are indicated or, at least, any local irritation should be investigated to determine the cause.

When one retires, all clothing should be removed. This is mentioned because of the common habit among campers and many persons working outdoors of wearing part of the daytime garments at night. Both the body and the clothing should be carefully examined, and the clothes should be so placed that any undiscovered ticks are unlikely to crawl from them into the bed. Exceptional care should be used when two persons occupy the same bed. If an infected tick becomes detached from one and attaches to the other, infection of the latter may take place quickly because the virus has already been reactivated. Instances of double infections caused in this manner by a single tick are

quite common. In one known instance three persons were thus infected by one tick.

Vaccine made at the Montana state laboratory is given subcutaneously in two 2 c.c. doses five days apart. Vaccine must be given yearly and is a partial protection against severe cases and fully protects against the mild. During the last thirteen years 9 per cent of the vaccinated individuals died as against 76 per cent of unvaccinated. Younger people respond better to vaccinations than older and have a lower mortality.

Tick paralysis is a more localized problem. It is reported from parts of Oregon, Washington, Idaho and Montana but is perhaps most prevalent in southeastern British Columbia. As far as known, it is caused only by the female Rocky Mountain wood tick and clears up after the surgical removal of the site of the tick bite.

Report of Case

Miss L. G., a young woman of twenty, spent her vacation of two weeks in August, on the seashore near Jacksonville, Florida.

She returned from her vacation, August 25, feeling well. Three days later, on August 28, she developed a severe headache, and went home from work. She had a high fever and chilly sensations. She had no real chills. She complained of a weakness and an aching feeling over the back, legs and entire body with continued headaches.

She was seen at home, and was treated for the grippe with the usual medications and sulfathiazole. She had a slightly reddened throat and other than a temperature of 104 degrees, there were no findings. Her skin was tanned and peeling from the Florida sunshine. There was no rash present.

On August 31, four days later, her mother called and said she had noticed a rash on her forehead, hands and feet. There was no rash on her body at the time. She was taken to the hospital, isolated, and was checked for typhoid, undulant fever, pulmonary infection, tularemia and septicemia. The rash up to this time had developed to a generalized macular spotted eruption extending over forehead, face, neck and body. It was also present on the wrists and ankles, legs and arms, including the palm and soles. These spots were about the size of a dime, and had a small red spot in the middle of each one. Normal skin appeared between each of these spots, giving the skin a definite spotted appearance, very much like the measles. This rash faded after several days, and just the small red spot was left in the center where each macule had been previously, and this disappeared on pressure.

The blood count was quite normal. Her hemoglobin was 80 per cent. She had four million red cells and twelve thousand white cells. Urine was normal except for a slight trace of albumin. Agglutination for Malta fever, tularemia and typhoid groups were negative. The blood cultures were sterile. Hemolytic streptococcus and colon organisms were isolated from the urine cultures.

It was suggested that a proteus agglutination be made for spotted fever or typhus. This showed a positive agglutination in a dilution of 1/30,000, which was the highest dilution the hospital laboratory had ever found. This made a diagnosis of either typhus or spotted fever, and from the fact that the rash began on her wrists, ankles and forehead, and also involved the palms of her hands and soles of her feet, a diagnosis of Rocky Mountain spotted fever was made. The rash in typhus fever appears on the chest and back and only involves the body. It usually does not extend to the hands and feet.

Her temperature on admission to the hospital was 104 degrees. The patient had been having 60 grains of sulfathiazole daily for a week previously with no effect. Intravenous Creosote was tried on the 5th of September, the third day in the hospital, and was given daily for four doses. The temperature receded gradually, and became normal from 103 degrees, one day after four daily doses of intravenous Creosote. The patient said she felt much better after these intravenous injections and asked to have them continued.

The patient's general condition had improved a great deal by the seventh day when her temperature was normal and she was discharged on the eleventh day.

A blood specimen was sent to the United States Public Health Service Rocky Mountain Laboratory at Hamilton, Montana, which is run by Dr. R. R. Parker. The report came back with a definite positive proteus agglutination, which they said indicated the diagnosis of Rocky Mountain spotted fever or typhus, and due to the location of the rash, and the geographic location, this was undoubtedly a case of Rocky Mountain spotted fever.

References

Hutton, Jack G.: Rocky Mountain spotted fever. Jour. A.M.A., 117:413, (Aug. 9) 1941.
Parker, R. R.: Rocky Mountain spotted fever. Am. Jour. Trop. Med., 21:369, (May) 1941.
Parker, R. R.: Rocky Mountain spotted fever. Jour. A.M.A., 110:1185, (April 9) 1938, and 110:1273, (April 16) 1938.
Sharp and Dohme: Seminar, May, 1942.

POLIO EPIDEMIC MAY BE COMING THIS SUMMER

Signs that an epidemic of infantile paralysis may be brewing for this summer appear in reports, from southwestern states especially, to the U. S. Public Health Service.

For the week ending July 3, latest for which figures are available, the total number of cases reported from all states and the District of Columbia was 190. The increase over the previous week's total of 136 cases is made up of increases reported from Texas, where the cases jumped from thirty-nine the week of June 26 to eighty the week of July 3, and Oklahoma, which had an increase from eight cases to twenty-three.

Infantile paralysis cases are expected to increase at this season, but the total number of cases reported since the first of the year was larger, on June 26, than for the same period of any years since 1934. The total for the first six months was 894, of which more than half were reported from California and Texas.

In California the cases seemed to be concentrated in Los Angeles County and other southern counties. For the week ending July 3, however, this state reported fifty-seven cases, which is one less than for the previous week.

No other state reported more than five cases for the week of July 3.—*Science News Letter*, July 17, 1943.

HISTORY OF MEDICINE IN DODGE COUNTY

BY JAMES ECKMAN
Rochester, Minnesota

and

CHARLES E. BIGELOW, M.D.
Dodge Center, Minnesota

(Continued from July issue)

Dr. John A. Sorg (1869-1898) was licensed to practice medicine in Minnesota on the same day Doctor Edgerton received his license; moreover, he was a classmate of Doctor Edgerton in the University of Minnesota College of Medicine and Surgery. It is believed that Doctor Sorg was in Kasson for a short while in 1896, possibly soon after his graduation from medical college in June. It is known that he was licensed to practice medicine in North Dakota on April 14, 1898, and at the time he was said to be living in Dickey County in that state.[158]

At some time in 1896 **Dr. George Ranson** (1871-1899), son of Dr. Stephen W. Ranson (1843-1904) of Dodge Center, joined his father in the practice of medicine in that town. Their professional notices are to be found in various issues of the *Dodge Center Record* in 1896, 1897 and 1898. As it had the career of Dr. James A. Garver's son, death cut short young Ranson's career in 1899, four years after he had been graduated from the University of Minnesota College of Medicine and Surgery.

By December of 1896 Doctor Giere of Hayfield had decided to return to Madison,[159] but before he left he asked **Dr. Lewis L. Mayland** (1871-), who at the time was associated with **Dr. Joseph A. Gates** (1870-1922) of Kenyon, to take his place.[160] Doctor Mayland agreed, and by the end of December he was well established in Hayfield.[161]

In August of 1897 **Dr. Elmer Ellsworth Harrison** (1866-1934), who had been graduated from the University of Minnesota College of Medicine and Surgery in June of that year, settled in West Concord. A native of Freeborn County, Doctor Harrison stayed in West Concord until 1933. He died in Worthington in 1934.

In March of 1898 two physicians left Dodge County. The first was **Dr. William M. Edgerton** (1870-1939) of Claremont, who moved to Faulkton, South Dakota. The second was **Dr. Charles Osborne Wright** (1864-) of Kasson, who went to New York City to obtain additional training at the New York Polyclinic Medical School and Hospital.[162] Doctor Wright soon returned to Kasson, but Doctor Edgerton never returned to Dodge County to practice medicine.

In April of 1898 **Dr. Charles S. Bigelow** (1845-1931) of Dodge Center decided to open an office in Claremont, his original location in Dodge County. He moved to that town, and in July of 1898 he brought **Dr. William Henry**

Tefft (1873-1938), who had just been graduated from the University of Michigan Department of Medicine and Surgery, to maintain his practice at Dodge Center.[163]

Dr. Mary Eliza Ranson (Mrs. A. Franklin Strickler) (1873-), a daughter of Dr. Stephen W. Ranson of Dodge Center, was graduated from the University of Minnesota College of Medicine and Surgery in 1898, and on June 16, 1898, was licensed to practice medicine in Minnesota.[40] She came back to Dodge Center to practice medicine with her father for a while, and remained in that town until February of 1899.

In September of 1898 Dr. Charles Osborne Wright of Kasson, who had returned from New York City, left Kasson to locate in Luverne,[164] where he is at the present writing (1943).

In the same month **Dr. James McPeek** (1852-1922), a native of Byron in Olmsted County, came to Kasson.[165] He stayed there for only a few months, leaving in March of 1899.

In November of 1898 a young man who had just been graduated from the old Keokuk Medical College in Iowa came to Hayfield. He was **Dr. N. Clausen Thimsen** (1871-), son of Steele County pioneers well known in Dodge County. He stayed in Hayfield until 1913.

In February of 1899 **Dr. Mary Eliza Ranson** (Mrs. A. Franklin Strickler) of Dodge Center accepted the post of junior physician at the Saint Peter State Hospital.[166] She never practiced medicine again in Dodge County.

In the spring of 1899 Doctor Tefft moved from Dodge Center to Claremont, and Dr. Charles S. Bigelow returned from Claremont to Dodge Center. In August **Dr. Anthony N. Sorenson** (1875-1901), a native of Claremont, came to Hayfield to take the place of Dr. Lewis L. Mayland (1871-), who was planning to leave Hayfield to go to Red Wing.[167] But Doctor Sorenson did not remain long in Hayfield. He went to South Dakota, as will be shown, where he was stricken with a fatal illness.

In November of 1899 a physician visited Kasson who did not stay there long. He was **Dr. Edward H. Kerkhoff** (1872-1918), a graduate of the Hamline University Medical Department in 1899, who had been licensed to practice medicine in Minnesota on June 16, 1898.[40] It is believed that Doctor Kerkhoff next went to Plainview in Wabasha County;[168] but he eventually located in Pierz, where he died in 1918.

Dr. Charles S. Bigelow had returned to Dodge Center from Claremont in the spring of 1899. On December 20, 1899, Doctor Tefft returned to the home of his parents in Belmont, New York, from Claremont.[169]

The chronologic portion of the present study ends with the departure of Doctor Tefft in the last month of the year 1899. It began with the coming of Dr. Josiah N. Dartt (1824-1874) to the county in the year 1854, and thus embraces a span of only about forty-five years. Almost the same number of years intervene between the departure of Doctor Tefft in 1899 and the present (1943), but the task of setting forth the history of medicine in Dodge County from 1900 onward awaits other hands.

An account of the history of the Dodge County Medical Society from its foundation in 1869 until its extinction in 1934, and short biographic sketches of certain physicians who practiced in Dodge County from 1854 to 1900, will conclude the present essay.

The Dodge County Medical Society

By the latter half of the nineteenth century Minnesota was well represented by various medical societies, which were, of course, established at greatly dif-

ferent times. A territorial organization, the Minnesota Medical Society, was founded in July of 1853, as Hamilton[170] has shown. The village of Saint Anthony had one in the same year,[171] and the city of Saint Paul had one in 1860.[172] A medical society was founded in the city of Winona in 1866, and the Winona County Medical Society was formed in 1869,[173] as were also the Wabasha County Medical Society[174] and the Goodhue County Medical Society.[175] The Dakota County Medical Society was initiated in 1870,[176] and the Brown County Medical Society was organized in 1895.[177] The Rice County Medical Society was founded in 1885, although another group may have antedated this body.[178] Steele County, although immediately adjacent to Dodge County, did not have a medical society until 1894,[179] and when one was organized, its first president was a former eclectic[54] and its first treasurer was a former homeopath.[180]

In view of the varying years in which the foregoing societies were established in cities or counties not far removed from Dodge County, the date of founding of the Dodge County Medical Society is noteworthy in that within slightly more than ten years after the county itself had been organized as a unit of the state, physicians within the county had made an attempt to organize themselves. The society seems to have been formed in September of 1869. In a newspaper account[33] of the event it was noted that: "The M.D.'s of Mantorville have organized a Medical Association called the Dodge County Medical Association. . . ."

It is not easy to trace the history of this pioneer medical organization. In section 2 of article 3 of the constitution[181] of the Minnesota State Medical Society it was provided that:

> SEC. 2. The officers of the county or district societies are required to report each year to the Recording Secretary of the State Medical Society, the names of all their members, to serve as a basis for the medical statistics of the State, and no physician not in good standing in his own county or district society, shall be admitted as a member of the State Medical Society.

If such reports actually had been made and preserved, it would be a simple task to chart the course of any county or district medical society in the state, but evidence indicates that few if any secretaries of county or district groups made such reports. At the eighth annual session of the Minnesota State Medical Society at Saint Paul in 1876 the president, Dr. Jacob H. Stewart[182] (1829-1883), announced that only one county society (presumably the Fillmore County Medical Society) had complied with the aforementioned provision. It may be, then, that the Dodge County Medical Society maintained its function for some years as a county organization only, without affiliating itself with the state society. The Dodge County Medical Society was still in existence in 1881, when it was disclosed that "The Dodge County Medical Society will meet at the Kinney House, Dodge Center, on Tuesday, March 15, at 1:00 p.m.—H. M. Sargent, M.D., Sec'y."[183] About a year later the society met at the office of Doctor Garver in Dodge Center.[184] At this meeting Doctor Garver was elected president for the ensuing year, and Dr. H. M. Sargent was reëlected secretary. Doctor Sargent and Dr. Christopher Porter Gibson (1848-1933) of Concord were appointed to be a committee to draft a constitution and formulate a fee bill, and Dr. Stephen W. Ranson (1843-1904) of Dodge Center and Dr. J. Clark Bliss (1846-?), then of Mantorville, were elected delegates from the Dodge County Medical Society to the thirty-third annual session of the American Medical Association which was to be held at Saint Paul on June 6, 7, 8 and 9, 1882. It is of record[185] that both Doctor Ranson and Doctor Bliss

attended this convention. Dr. John Jacob Everhard (1829-1908) of Kasson also attended it as a visitor, and Dr. Jasper Bedient (1838-1920) of Kasson was present as a permanent member of the American Medical Association.[185]

By the year 1890 the Dodge County Medical Society apparently was moribund, for in the nineties Dodge County physicians as a rule attended meetings of the Olmsted County Medical Society. Moreover, the Southern Minnesota Medical Association was organized at Winona in July of 1892, with Dr. Franklin Staples (1833-1904) of Winona as the first president,[186] and several Dodge County physicians were accustomed to attend its sessions.* Dr. Stephen W. Ranson (1843-1904) of Dodge Center was elected president of this association in 1897.

On May 24, 1905, at Dodge Center, the Dodge County Medical Society was reorganized. All the physicians in the county were present, and at a later meeting (on June 14, 1905) the constitution and by-laws recommended by the American Medical Association were adopted. In 1906, it is known,[187] the society held meetings regularly, and had an annual meeting in May of that year. Dr. Amos L. Baker (1852-1932) of Kasson was president, and Dr. Elmer E. Harrison (1866-1934) of West Concord was secretary. Among members were Dr. Charles Sumner Bigelow (1845-1931) of Dodge Center, Dr. Frank French Clifford (1863-) of West Concord, Dr. N. Clausen Thimsen (1871-) of Hayfield, and Dr. Osmon F. Way (1858-1936) of Claremont. Other physicians were members at this time, but they have not figured previously in this chronicle and hence need not be mentioned in this connection.

The Dodge County Medical Society after the reorganization of 1905 maintained itself with vigor until the year 1933. On July 5, 1933, members of the Olmsted-Houston-Fillmore County Medical Society, according to the present secretary,[188] voted to accept the application of the Dodge County Medical Society to affiliate itself with the larger society. The organization is now known as the Olmsted-Houston-Fillmore-Dodge County Medical Society, and the charter which this four-county group received from the Minnesota State Medical Association bears the date July 15, 1934.

Certain Early Dodge County Physicians

Dr. Josiah R. Dartt (1824-1874) was, so far as is known, the first physician to settle in Dodge County permanently. After his return from the War of the Rebellion he practiced medicine only infrequently, if at all. This pioneer settler and physician was born in Weatherfield, Windsor County, Vermont, on September 11, 1824, the fifth of seven children of Erastus Dartt (1792-1851) and Rebecca Jackman Dartt (1792-1877). According to the *Dodge County Republican*,[56] Doctor Dartt remained in his native town of Weatherfield until he was twenty-two years old; he then removed to Groton, Massachusetts, where he was married. He lived in Groton for about three years; then journeyed westward to Kingston in Marquette County, Wisconsin. There he studied medicine under a preceptor, and attended the Chicago Medical College, from which he was graduated in about 1853 as a Doctor of Medicine. In one source[11] it was said that he settled in Dodge County in the summer of 1854; in another[5] it was said that he came to the county in the fall of 1854; in still another it was said that he did not arrive until May 15, 1855.[189] Lord[1] said simply that Doctor Dartt came to Dodge County in 1855.

*As late as 1903 Dr. Carlos Lord Chambers (1858-1904) of Kasson and Dr. Amos L. Baker (1852-1932) of Kasson were members of the Olmsted County Medical Society. Dr. Stephen W. Ranson (1843-1904) of Dodge Center was not a member of any county medical society, but was, on the other hand, a member of the Minnesota State Medical Association.

His professional card:

DR. J. R. DARTT, M.D.
Physician and Surgeon
Office at Drug Store
Mantorville, M.T.

is to be found in several issues of the first volume of the *Mantorville Express* (1858), and in one issue[17] in particular is contained a notice of dissolution of a partnership between Doctor Dartt and W. L. Bennett. They had operated a drug store in Mantorville together; doubtless it was the one referred to in the aforementioned professional card.

At various times before the War of the Rebellion Doctor Dartt explored the reaches of Southern Minnesota, once (1858) going as far as what later (1861) became the Territory of Dakota. When the war broke out, he sold his store to Benjamin S. Cook (1833-1905), who had opened a general store at Concord in 1856, with Dr. T. G. Ingraham. Doctor Dartt then became a private soldier in Company A of the Fifth Minnesota Regiment of Volunteers. In May of 1862 he was commissioned a captain of infantry, but resigned this commission on April 12, 1863, because of ill health.[190] He returned to Dodge County to devote his remaining years to his 160-acre farm near Mantorville, where he raised hops, apparently not very successfully.[1] In 1869 he became captain of a company of militia recruited in or near Mantorville,[1] and was chairman of the town board of Mantorville in the years 1861, 1864, 1867, 1870 and 1871.[11]

Doctor Dartt died at Mantorville on September 11, 1874, at the comparatively early age of fifty years. His esteem in the county and surrounding country is reflected in the fact that at least 1,200 persons attended the funeral;[191] they constituted a throng so huge that the sashes were removed from the windows of the Methodist Church so that the multitudes outside could hear the service, and the officiating clergyman spoke from one of the windows of the church instead of from the pulpit.[1]

"He was a man with whom friendship strengthened with acquaintance," it was said[1] of him after his death, "and those who knew him best are those by whom he will be most missed. During his last sickness (which was very severe) he received all the attention and relief it was possible for human kindness to bestow, and in his death the community loses one of its most prominent and respected citizens."

Lord[1] said that "Doctor Dartt was a man of more than ordinary ability and was decidedly popular among all classes of people."

Dr. James Mansfield Ryder (1822-1900) was born in Clyde, New York, in September of 1822.[192] He came to Milton Township in Dodge County in 1855, as has been said, where he farmed and practiced medicine among his neighbors until about 1889, when he moved to Buffalo in Wright County.[142] From Wright County he went to California, where he lived for about a year. He finally moved to Oregon, and he died at McCoy, Oregon, on May 29, 1900, of apoplexy.[192] In Oregon he was known affectionately as "Uncle Tim" Ryder, and it was said that his patients usually came to his house for treatment. Since he practiced homeopathic medicine in Oregon,[192] it is assumed that such was his inclination while he practiced in Dodge County. He was, however, never licensed to practice medicine in Minnesota,[40] and the executive secretary[193] of the Board of Medical Examiners of the State of Oregon has reported that he was never licensed to practice medicine in that state.

Dr. Staunton B. Kendall (1808-1897) was born in Rutland, Vermont, on March 17, 1808.[25] When he was about twenty years old his family moved to Canton, Pennsylvania, where the young man studied medicine, probably under a preceptor. In the year 1856 he came to Dodge County, where he pre-empted a farm near Ashland and practiced homeopathic medicine among his neighbors. He was elected first assessor of Ashland Township in 1858,[5] but left Dodge County in 1862 and soon settled in Byron in Olmsted County, where he lived until his death. At some date now not known he was married to Miss Emily Fairbanks, who lived near Dodge Center. In Byron Doctor Kendall erected the first hotel in the village, and he dispensed his own drugs and practiced medicine there for years. On May 14, 1872, Doctor Kendall was elected a member of the Southern Minnesota Homeopathic Medical Society,[25] and he was licensed to practice medicine in Minnesota on November 28, 1883, by exemption. He was said to have been a good friend of Dr. William W. Mayo (1819-1911) of Rochester, even though the two men embraced opposing systems of medicine.[25] Doctor Kendall died on November 9, 1897, and was buried in the cemetery at Byron.[25]

Dr. William P. Miller (1806-1873) was born on June 17, 1806, and it is possible that he was born in Cincinnati, or at least in Hamilton County, Ohio, where he may have practiced medicine for a while. It is also thought that before he came to the Territory of Minnesota he lived in Indiana. Doctor Miller, with Doctor Garver, came to what is now Wasioja in Dodge County in the spring of 1856, and there he pre-empted land and built the first store in the village,* in which he sold a few common drugs and handled general merchandise. In September of 1868 he was appointed postmaster at Wasioja,[194] despite the fact that he was an active Democrat and that the administration of President Andrew Johnson (1808-1875) was, nominally at least, Republican.† Doctor Miller continued to operate his small store and to practice medicine at Wasioja until the year 1870. In January of 1870 he had journeyed to Saint Paul, where a Democratic convention was in progress. He was suddenly stricken with paralysis one night at his hotel in Saint Anthony. So severe was the affliction that he could not speak to those who sought to minister to him.[195] Papers found upon his person finally disclosed his identity, and a telegram was dispatched to his family in Wasioja. Doctor Garver and some of his family proceeded to Saint Anthony to bring the aged man home. He withstood the trip, but never recovered his faculties. Thereafter he was confined to his bed in Wasioja, speechless and helpless, where he was groomed and cared for by members of his family. He died on May 19, 1873, at Wasioja, and was buried in the Wildwood Cemetery at Wasioja with full Masonic honors.[196]

Doctor Miller was a spare man, grey-haired, and of average size. He customarily wore a goatee. Of his medical ability not much is known, and it is not known from what medical college he was graduated, or whether he was graduated from any school, but he practiced homeopathic medicine. It is probable that Doctor Miller was not nearly so well trained in medicine as his brother-in-law, Doctor Garver, although it would be impossible to verify such a statement now, some seventy years after the death of Doctor Miller. Doctor Miller's grandson, Dr. Victor I. Miller (1875-), is now (1943) a specialist in diseases of the ear, eye, nose and throat in the Mankato Clinic.

*The store, much altered, is still standing (1943) in Wasioja.
†He had been nominated for the vice presidency in 1864 as a War Democrat, on the Republican ticket. In 1874 he was elected a United States senator from Tennessee as a Democrat.

(To be continued in the September issue)

President's Letter

AN OPEN LETTER TO DR. FISHBEIN

July 21, 1943

Dr. Morris Fishbein,
Editor, Journal of the American Medical
Association, Chicago, Illinois
Dear Doctor Fishbein:

In the editorial entitled "Doctors in Congress" which appeared in the *Journal of the American Medical Association* of June 26, the Editor has given me the doubtful honor of quoting from my presidential address delivered at the annual banquet of the Minnesota State Medical Association in May. The honor is a doubtful one because the excerpt, standing by itself, misrepresents my argument and conclusion and creates an impression which is diametrically opposed to the tenor and purport of the address as a whole. I am sure that I need not point out to you the unfairness of such garbled quotation for, doubtless, you yourself also have suffered from similar improper and unwarranted use of partial quotations from statements that you have made.

My astonishment was increased when I learned, later, that the same editorial had been released in its entirety to the press of the country in the *American Medical Association News.* I am not unwilling to be properly quoted in either the *Journal* or the *Association News,* and the statements which your editorial quotes were in no way private or privileged, but I seriously object to the use of the partial, and therefore wholly misleading quotation in the original editorial and its dissemination to the news services.

In my address I purposely refrained from relating the details of the controversy at the Minnesota State Capitol this spring, because they were already familiar to many of our members. The quotation that you used in your editorial would lead an uninformed person to conclude that the Minnesota State Medical Association had been defeated and discredited. The exact opposite to that conclusion is true. The controversy arose over an appointment in which the principle of the free choice of physician by the workman-patient was involved. The Association won its contention for such free choice and it received support in the position that it took, from all elements in the community including editorial writers and leaders of organized labor, and the great majority of the members of the Minnesota State Legislature.

The use of the garbled quotation in the editorial had the effect, whether intentional or not on the part of the Editor, of discounting the proposal for better representation of the AMA in Washington through the newly-created Council on Medical Service. Opposition to that proposal was to be expected, but in spite of it the amendment to the By-Laws of the Association, providing for such Council was adopted without a single dissenting vote. The releasing of the editorial to the public press at this time is, therefore, ill-timed and unfortunate, and can only have the effect of discrediting and obstructing this Council, even before it is fairly organized.

It seems to me that the use of the quotation, in the manner referred to above, was highly improper for it misrepresented not only my own views (a matter of small importance) but also the position of one of the constituent bodies of the AMA, viz. the Minnesota State Medical Association.

Yours very truly,

Stephen C. Bagley

President, Minnesota State Medical Association

Editorial

Carl B. Drake, M.D., *Editor;* George Earl, M.D., Henry L. Ulrich, M.D., *Associate Editors*

MATERNITY AND INFANT CARE FOR WIVES AND SICK INFANTS OF ENLISTED MEN

ACCORDING to the announcement mailed to Minnesota physicians last month, federal funds have been made available to the United States Children's Bureau for the obstetrical care of the wives and sick infants of enlisted men of the fourth, fifth, sixth and seventh grades.

This financial assistance is being distributed through the Division of Child Hygiene of the Minnesota Department of Health located on the University Campus.

Confusion resulted when it was first announced last year that such federal funds were available. However, Minnesota never qualified to receive the assistance because its plan of administering the funds was not approved and before this could be adjusted the funds were exhausted.

Effective July 6, 1943, the federal government will pay physicians and hospitals for obstetric care and for the care of sick infants of enlisted men irrespective of their financial status. Forms, which may be obtained from the Division of Child Hygiene, should be filled out and authority obtained for financial assistance from the government of these individuals. This is a service which enlisted men obtain during peacetime, and as it cannot be provided by army personnel at present this method has been devised.

THE WAGNER-MURRAY BILL

THE Wagner-Murray Bill submitted to the Senate June 3, 1943, is an almost incredible attempt to substitute state medicine for private practice by the inclusion of the medical and hospital care of some 110,000,000 of our population in the bill providing social security on a broad scale similar to the Beveridge plan in Britain.

In brief, employes are to be taxed six per cent of their wages, employers another six per cent of the payroll, every self-employed individual seven per cent on the market value of his services up to $3,000 per year and government employes will pay three and one-half per cent of their salaries. Of the estimated $12,000,000,000 so raised, some $3,000,000,000 will be allocated to The Medical Care and Hospitalization Account, the expenditure of which will be under the direction of the **Surgeon General** of the United States Public Health Service. He is authorized and directed to take all necessary and practical steps to provide medical and hospital care for the people of the country, to designate the individuals or groups of physicians and the hospitals which shall furnish the service and to pay for such service. A National Advisory Medical and Hospital Council of sixteen members shall be appointed by the **Surgeon General** to act in an advisory capacity, but without authority. Any qualified physician can furnish medical service according to rules presented by the **Surgeon General.** Every individual shall be permitted to select his own doctor in accordance with rules presented by the **Surgeon General.** The **Surgeon General** shall publish the names of general practitioners who have agreed to furnish service and shall designate the specialists. Fee schedules are to be approved by the **Surgeon General,** who shall arrange for part-time or whole-time service and the **Surgeon General** may prescribe the maximum number of patients for each physician.

In fact if this Bill 1161 is passed, private practice in this country will be at an end and one man, the **Surgeon General** of the Public Health Service, will have a czar's direction of the medical and hospital care of our people and the expenditure of a sum almost equal to the total yearly revenue of the Federal Government in the nineteen-twenties.

Will Congress give serious consideration to this bill which would make medical care a governmental function and would eliminate private practice as we know it? We think not. And yet, during the stress of war the unexpected might happen.

There are certain individuals in our body

politic who are bent on socializing all activities in our country. They are prominent in government circles in Washington. They would destroy private industry and incentives which have made the standard of living in the United States the highest in the world.

The American physician is an individualist. He studied medicine because he wanted to become a physician and in many cases did so in spite of financial handicaps. He values his medical degree because of the effort involved in obtaining it. A physician's practice is competitive, and as a rule the most efficient physician is the most successful. In spite of acknowledged deficiencies in our medical system, our competitive system supplies the best medical care in the world, far superior to that in most foreign countries with socialized medicine.

The question arises whether the present provision whereby all medical students are put in uniform, become members of the reserve and have their expenses paid by the government in addition to monthly pay, is a wartime necessity. There has never been a dearth of medical students; the medical schools for years having had more applicants than they could possibly accommodate. It is true that being in uniform signifies that the medical student is doing his part in the present conflict and for this reason, as well as for financial ones, it is desirable for the student. Is a medical student who, at no financial outlay on his part or that of his family, undertakes the study of medicine, as likely to put forth as much effort to obtain his degree as though he had paid for the training? Upon graduation will he not be psychologically conditioned to accept further governmental pay as a doctor and avoid the competition of private practice?

During a war governmental powers must be increased and many phases of life must be regulated. Taking over by the government of the medical care of its citizens is not a war emergency, although it would appear that advantage is being taken of the present crisis to try to put through this legislation at this time. Possibly the main reason for the presentation of this bill at this time is to further public discussion.

Discuss the bill we shall. Is there any reason for believing that the health of our citizens will be improved if all medical care is administered by a czar in Washington with control of medical personnel and fees, hospitals and hospital rates, number of patients a physician may have, et cetera? Such an undertaking would incidentally require an enormous expansion of the Public Health Service, an enormous administrative expense, the throttling of individual initiative and a lower grade of medical service.

The public is submitting to regulation of many phases of life by Washington bureaus because of war necessity. The typical American does not relish unnecessary regulation and it is certain that after the war there will be a reaction which will lead to the abolition of unnecessary bureaucratic control. It should not be forgotten that our government was formed by the people to make certain needed regulations for the common good, not to interfere with legitimate activities of citizens and not to act as a dispenser of benefits—medical care included.

Congress is in recess at present. The present addresses of our Senators and Representatives are given below and members are urged to write and express their opposition to the Wagner-Murray Bill.

Senators

Joseph H. Ball, 2119 Iglehart Avenue, Saint Paul, Minnesota

Henrik Shipstead, Miltona, Minnesota

Representatives

August H. Andresen, Red Wing, Minnesota

J. P. O'Hara, Glencoe, Minnesota

Richard P. Gale, Mound, Minnesota

Melvin J. Maas, House of Representatives, Washington, D. C.

Walter H. Judd, 4626 Emerson Avenue South, Minneapolis, Minnesota

Harold Knutson, Manhattan Beach, Minnesota.

H. Carl Andersen, Tyler, Minnesota

Wm. A. Pittenger, 2826 East Second Street, Duluth, Minnesota.

Harold C. Hagen, Crookston, Minnesota

ADDITIONAL FOOD FOR PATIENTS

ACCORDING to regulations of the Food Rationing Board individuals are allowed additional food upon certification by their physicians. To most physicians this is a new and complicated task for they have left the food question and the

handling of coupons to their wives and have not acquainted themselves with the details of regulations. As a result they are often at a loss to know even approximately how much additional food a patient may require. Some physicians in desperation have signed the requisition form and have allowed their patients to fill in the amounts they desired. This has led to the request for additional amounts of various items such as in one instance eighty pounds of beef, eighty pounds of mutton, ninety pounds of bacon, sixty pounds of cheese for a two months period for one person which was absurdedly excessive. Such requisitions rather reflect on the capacity of the profession to certify for food increases for patients. Also there is nothing to prevent the patient from adding to the amounts specified by the doctor inasmuch as the form is returned to the patient for presentation to the Board.

The present rationing of food permits plenty of food in variety and amount for the average individual whether in sedentary occupation or one requiring great muscular activity. While rationing may and generally does require a change in dietary habits only a limited number of specified foods are rationed and one has a wide variety of unrationed foods from which to choose.

As a matter of fact there are very few patients who actually require additional foods.

The diet of the diabetic today much more nearly approximates the normal than it did before the advent of insulin. Additional protein and fat can be obtained in most cases from nonrationed foods such as fish, eggs, cream, cottage cheese and certain oils. Cream cheese too requires few stamps. A certain amount of protein is derived also from milk, bread and cereals which are not rationed.

The same considerations would seem to apply to the underweight and anemic patients.

In summer when fresh vegetables and fruits are abundant there is less need for additional food for patients. In winter when frozen and canned fruits and vegetables must be largely substituted for the fresh, additional coupons are more likely to be needed. Physicians should remember that a can of either fruit or vegetables will supply more than one portion to a patient.

There is one situation in which a patient, a diabetic for instance, needs additional coupons. This is when the patient lives alone or with one other person and the coupons allotted are not sufficient to make substantial purchases at one time.

An occasional patient may therefore require certification by the physician. The necessity for changing dietary habits is not sufficient reason for seeking the aid of the physician. All of us may have to make considerably more sacrifices dietary and otherwise before this crisis is over. A few words of explanation to the patient as to the substitution of nonrationed foods should clear up the supposed dilemma with which he may honestly believe himself confronted.

Medical and Surgical Relief

More than $59,000 of medical and surgical supplies were donated during the past six months by the Medical and Surgical Relief Committee to the U. S. Navy, the U. S. Coast Guard, the armed forces of our Allies and to welfare groups here and abroad. This brings the total value of shipments up to $551,699.24 since the Committee was launched three years ago.

The detailed semi-annual review presented to the executive committee at headquarters at 420 Lexington Avenue, reported that over 500 portable emergency medical kits were furnished by the Committee to Navy subchasers, destroyer-escorts and Coast Guard patrol-boats. Specially designed for the small sub-hunting craft, the patrol-boat and sub-chaser kit is equipped with drugs and instruments to give immediate treatment to casualties or accidents. The medical kits are consigned through the 13 U. S. Naval Districts or are sent directly to the ships' commanding officers.

Sixty-three emergency medical field sets, consisting of two large cases containing antiseptics, bandages, drugs and an instrument roll, were distributed by the Committee among Navy and Coast Guard units, to the War Shipping Administration, the British West Indies, and to several civilian defense stations. (This makes a total of 312 field sets.)

The French forces in North Africa and Little Norway in Canada received the bulk of the Medical and Surgical Relief Committee's foreign donations for the past half year, according to the semi-annual report. The crates of operating sets, medical kits and other supplies for the North African French are dispensed by the Fighting French Corps, the French Red Cross and the American Friends Service in Libya.

In July, 1940, the Medical and Surgical Relief Committee was organized to gather supplies for understocked emergency stations and field hospitals crowded with bomb victims in Great Britain. As the war spread, the Committee's scope was increased to answer appeals for help from Greece, Russia, China, the Fighting French, the Royal Norwegians, missionary doctors in Africa and India, and, since our entry into the war, from the United States. Beginning with a handful of philanthropic doctors in New York City, the Committee has grown to an operating membership of over 500 doctors in forty-four states.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

THE NEW COUNCIL ON MEDICAL SERVICES: ITS DUTIES AND POWERS

A new Council on Medical Service and Public Relations was created by the House of Delegates of the American Medical Association in June. This Council was endowed with complete authority to conduct the public relations of the association, including the authority to establish a listening post for medicine in Washington.

The report of the Board of Trustees recommending creation of this autonomous council was a consolidation of favorable reports from two reference committees of the House. These committees had before them for consideration no less than eight resolutions asking for an independent committee or council of this character and no reservations as to the powers of the projected agency were attached, either to the committee recommendations or to the resolution as finally passed.

It is true that an amendment calling specifically for the creation of a permanent office in Washington was subsequently proposed by the Ohio delegates. This amendment was designed to support the Council in carrying out the obvious will of the delegates. It was rejected on the advice of Dr. Thomas A. McGoldrick, chairman of the Reference Committee on Medical Legislation and Public Relations, on the ground, not that the amendment itself was undesirable, but that the original motion had already invested the Council with full authority to act, including authority to establish any type of permanent representation in Washington which might seem best fitted to its purposes.

Delegates Amazed

For that reason the editorial attitude of the *Journal of the American Medical Association*, expressed in two subsequent editorials, has caused quite general amazement and consternation.

Is it possible that the editor or the administration of the AMA wishes to dodge or circumvent the clear will of the House of Delegates on this matter?

If so, is there a possibility that the new Council which, at this writing, has still to hold its first organization meeting, will be unduly influenced by the obstructive policy expressed in these editorials? Is it conceivable, in spite of the constructive action taken in Chicago, that the great body of physicians of the United States will continue to struggle along with outworn public contacts and methods wholly unsuited to the needs of the times? The answers to these questions are important enough to demand serious consideration.

Took Active Part

The letter published below was addressed by Dr. W. L. Burnap of Fergus Falls, chairman of the Council of the Minnesota State Medical Association, to Dr. Morris Fishbein, editor of the *Journal of the American Medical Association*. It should be recalled that Dr. Burnap was a leader in the nation-wide movement for better public representation of the medical profession. He is 1943 president of the National Conference on Medical Service which endorsed a resolution directed to that end at its February meeting, and he took an active part in drawing up and presenting one of the widely quoted resolutions submitted to the AMA delegates at Chicago. The letter conveys Dr. Burnap's reaction to the two editorials, the first of which, published June 19, declared categorically and incomprehensibly that the delegates had refused to approve the establishment of an information headquarters for the association in Washington. The second, which appeared under the title "Doctors in Congress" on June 26, discounted the need for any better source than now exists for public information on

medicine and warned of the danger involved in active participation by physicians in public affairs.

Issue Misconstrued

By way of illustration, there were two misquotations from Minnesota physicians in the second editorial (perhaps because Minnesota was generally recognized as one of the rallying points for delegates who demanded a change of policy in Chicago). Misquotation, in this case, did not, of course, consist in actual change in wording. It consisted in quoting out of context, a maneuver which is even more likely to becloud the issue.

One of the physicians quoted was the president of the Minnesota State Medical Association, Dr. Stephen H. Baxter of Minneapolis, whose personal letter addressed to Dr. Fishbein and requesting an explanation is printed on the President's Page in this issue. The other was Dr. Walter Judd of Minnesota, congressman from the Fifth District. The excerpts used were from addresses made by both at the annual banquet of the Minnesota Association.

Dr. Burnap's letter follows:

July 17, 1943

Morris Fishbein, M.D.
American Medical Association
535 North Dearborn Street
Chicago, Illinois

My dear Dr. Fishbein:

I note in your editorial in the *AMA Journal,* June 19, 1943, that among other statements you say, "The House of Delegates voted by a large majority against the establishment of a Washington office." I am interested in knowing when that vote was taken. I have taken considerable pains reviewing the action of the House of Delegates, and as far as I or a number whom I have consulted can ascertain, no such vote was ever taken. It is my feeling and that of those with whom I have had an opportunity to converse, that the editor of the *AMA Journal* should confine himself to facts and not allow his personal prejudices to color his interpretations. If we are mistaken in this matter, we will be pleased to be set aright. If you are wrong, we would consider it a manly act to correct yourself.

I will also state that in another editorial on June 26, you allowed your personal feelings to color your interpretation of the remarks of Stephen H. Baxter, President of the Minnesota State Medical Association, and the results of our controversy with Governor Stassen. It is true that a certain Senator did, in the heat of battle, suggest that an investigation be made of the activities of the representatives of our Association in the Capitol. However, this resolution was dropped, and the Senator who introduced it apologized profusely to Rosell, Brist, and Sogge, and admitted that he alone was the loser in the matter.

The controversy with Govérnor Stassen closed with a complete victory of the Minnesota State Medical Association over two-thirds of the Senators standing loyally by. Nothing that has happened in Minnesota has so added to the high standing of the medical profession of Minnesota or added so many friends as this controversy with Governor Stassen, because it was fought in the interests of the people against political maneuvers, and is so interpreted by those who are informed in the matter.

Yours very truly,
W. L. Burnap, M.D.

As Dr. Burnap so forcefully points out, the contest over the appointment of Mr. N. H. Debel to the Industrial Commission closed with a complete victory for the medical association and the editor of the *Journal* seems, therefore, to be laboring under some misconceptions in so far as that episode is concerned. It is true that the association encountered vigorous opposition. It is true that there was a demand for an investigation and the Governor, who sustained the first defeat in his phenomenal career, was quite naturally indignant. Such evidences of opposition are the normal and not unwholesome sequelae of active participation in public affairs.

Cited by themselves, as Dr. Burnap indicates in his letter, they give a wholly false picture of the situation in Minnesota. They do not convey the overwhelming and heartening support received by the association from the general public, from the newspapers and from the sections most involved in dealing with the Industrial Commission, the working men and their organizations. Evidence of the gratitude of labor appeared in the communication of Gottfrid Lindsten of the Brotherhood of Railroad Trainmen published in the July issue of Minnesota Medicine. The attitude of the press is well conveyed in an editorial from the *New Ulm Daily Journal* reprinted elsewhere in this section.

No Danger To Medicine

Physicians of Minnesota were fighting for a sound principle and their courageous stand brought to their support all men of good will, in and out of the state government, with the exception of those whom political divisions accidentally lined up with the opposition.

It should be pointed out again that the hazards

of such action do not lie at all in the possible involvement of physicians in public legislative battles. They lie rather in timidity, in compromise with bad counsel, in obstruction and inaction. Surely there is no danger to medicine in the honest and vigorous protection of sound standards of medical practice nor in the resolute championing of the rights of the sick.

Seven Doctors

The quotation from Dr. Judd to the general effect that there are now seven doctors in Congress seems equally misapplied.

It would appear from the AMA editorial that Congress, having seven doctors in its elected membership, needs no outside instruction on medical matters. If seven doctors of medicine cannot keep Congress on the right path as regards health and medicine, then Congress is simply not susceptible to instruction, according to the editorial, and what could any agency representing the profession outside of Congress hope to accomplish? The question is put, of course, by implication.

The answer is obvious to anyone who has had any practical experience with the legislative process, which it is quite apparent the writer of the editorial has not. Even in a state law-making body the task of watching the multitudinous bills introduced at each session is a full-time job. To follow those which in any way affect medicine or the public health through all the committees and all the vicissitudes of back-stage maneuvering requires the full knowledge and resourcefulness of experienced representatives. In the Congress the task is magnified many times. It is clearly absurd to expect such service from elected physicians who are representatives of all of the people in their districts, and whose interests must extend beyond matters of health or the welfare of their professional brethren.

They Went Home

It is certainly true that the Seventy-Eighth Congress will be better informed than usual about many matters connected with medicine and the public health because of the presence in that body of the dynamic and fearless young physician-congressman from Minnesota. Informing Congress about medicine is just one of many jobs for Dr. Judd, however, though the heroic fight he put up to remove the proviso in the appropriation bill permitting all licensed healers to participate in obstetrical programs under the Children's Bureau, shows how ready he is to do what he can to protect standards of medicine in the United States.

It happens that there is a pertinent reason why this very proviso was retained in the bill in spite of all Dr. Judd and two medical colleagues in the House could do to secure its removal. At the crucial moment, there was no one available on the spot to help them off-set the under-cover manipulations which finally prevailed. Representatives of organized medicine and of the public health officials who should have been watching at every step, were not only absent from the House but had left Washington, mistakenly believing the fight was won.

More Information Needed

Information provided to Washington agencies by the various bureaus in Chicago of the American Medical Association serves its own excellent purpose and should be encouraged. Nevertheless such bureaus are no substitute, in any sense whatever, for informed Washington representation, on the ground. That, at least, is the opinion of Dr. Judd, himself, expressed vigorously in the same banquet address to the Minnesota State Medical Association, though not quoted by the writer of the *Journal* editorial. Such an office would have information to give, of course, not only to Washington agencies and the Congress, but to the people back home.

It would also have the time, the experience and the definite commission to aid in guiding all legislation and regulations affecting medicine and the public health, in accordance with sound scientific principles.

It is the considered belief of the delegates who attended the June meeting of the House of Delegates of the American Medical Association that the new Council on Medical Service and Public Relations has all of the powers and authority necessary to establish such representation, if it sees fit, to aid in the war effort now and to assist in planning for health in the postwar period.

AN UNWARRANTED ATTACK*

We are sorry that Governor Stassen in his last days of office had to cover up his disappointment that two of his appointments had failed of confirmation by making a blistering attack upon the State Medical Association and the doctors of the state. The Medical Association was attacked simply because it refused to play politics or compromise an important principle.

What exasperated Governor Stassen was that a large and important group of men were so loyal to certain principles that they refused to bend to political expediency or party conniving. For years the State Medical Association has contended that a man should always have the right to select the doctor of his own choice and not be forced to have anyone pick the doctor some bureaucrat might think he ought to have. Faith in one's doctor sometimes is as important as the medicine or the treatment and the relationship between the patient and his doctor is almost the same as the relationship between a man and his minister, priest, or rabbi. Whether the bill is paid for by the state, the insurance company, or the county, the doctors have contended that this principle was fundamental.

One of the appointments Governor Stassen wanted was a man who had insisted that the industrial commission had the right to appoint the doctors and the patient had no voice in the matter. When this appointment was made, subject to confirmation by the senate, the doctors of the state rebelled and finally defeated it.

Mixed up in the deal was the appointment of Arthur Ramberg, Duluth labor leader who secured the labor endorsement of Stassen and Ball up at Duluth last summer. At the time there were ugly rumors of labor leaders with $200 bills in their pockets and out of it came the backing of Governor Stassen of Ramberg for railroad and warehouse commissioner. Ramberg didn't do any better in this race than he has done as an appointee to industrial commission, and hence the pique of Governor Stassen and his intemperate letter against the doctors.

In these days when strange forces are working to foist upon America new systems of government and new social reforms, it is encouraging to have a group of men like our Minnesota doctors who refuse to compromise principles or agree to cheap and tawdry political deals.

*From *The New Ulm Daily Journal*, April 22, 1943.

CONGRESSIONAL CONFERENCE

To no group are the issues now before Congress of more immediate and vital importance than to the medical profession. Upon the reaction of Senators and Congressmen to such issues as compulsory sickness insurance, now before Congress in the Wagner-Murray-Dingell bill, may depend the future of medicine for a generation in this country.

Obviously physicians must take advantage of every opportunity to be heard on this matter. It is therefore of the greatest possible interest to the medical profession that a conference in Minneapolis has been arranged between members of Congress from no less than five Northwest states and representative groups of citizens in this area.

These conferences will be held Monday, August 16, at the Radisson Hotel in Minneapolis and one of them, scheduled at 7:30 p.m., will be devoted exclusively to the problems and policies of medicine, dentistry and pharmacy with respect to national legislation and regulation. At least twenty-five Senators and Congressmen from Minnesota, Wisconsin, Iowa, North Dakota and South Dakota will be present. They have already indicated a desire to listen to what their constituents in these groups have to tell them, not to talk themselves. Representatives of all three key professional groups will have an unprecedented opportunity to present their views to a group of men whose combined vote might well decide their professional future.

Morning and afternoon conferences on the same day will be held with farmers and businessmen of this section. The evening program had not been completed at this writing but it is understood that qualified representatives of medicine, dentistry and pharmacy will be chosen as spokesmen and that the talks may be followed by discussion periods.

It should be remembered that the size and earnestness of the audience will be as impressive to the members of Congress as the actual opinions presented. It is therefore highly important that as many physicians as possible arrange to attend.

INDUSTRIAL HEALTH

Edited by the Committee on Industrial Health and Occupational Diseases

A. E. Wilcox, Minneapolis, Chairman

H. B. Allen, Austin
L. S. Arling, Minneapolis
Martin Aune, Minneapolis
Richard Bardon, Duluth
P. H. Bennion, Saint Paul
R. B. Bray, Biwabik
R. P. Caron, Minneapolis
T. H. Dickson, Saint Paul
T. A. Lowe, South Saint Paul
J. L. McLeod, Grand Rapids
C. M. Smith, Duluth
H. G. Wood, Rochester

INDUSTRIAL PHYSICIANS ARE NEEDED

The War Participation Committee of the American Medical Association recently requested the Council on Industrial Health to develop a plan which would enable the medical profession to contribute more directly to industrial health in small industrial plants. This step was taken in full realization of the dwindling numbers of physicians who would be available to supply this service.

The Council on Industrial Health has for some time recognized the need to establish more adequate medical programs in the smaller industrial plants which employ 85 per cent of the industrial population, but which have no full- or part-time medical services. The Council has been active in organizing committees on industrial health in state medical societies and in county societies in industrial areas. In suggesting the programs for these committees, the Council has emphasized the need to establish lists of physicians who would volunteer to enter this type of service, and has pointed out the need to provide opportunities for postgraduate training for those physicians who are so interested.

Profession To Be Surveyed

The procedure in establishing such a program is (1) to survey the profession to determine the names of physicians who are interested in industrial practice, and (2) to arrange conferences to work out details of the program with representatives of the State Procurement and Assignment Service, executive officers of the state medical society, the manufacturers' associations, representatives of labor, and the state committee on postgraduate education. The local manufacturers' associations would be informed that if a plant contemplates additional medical service, application for personnel should be made to the state committee on industrial health, or to county committees where such exist. These committees in turn would decide whether the need is valid and, if so, would submit the names of local physicians who are available.

The essential features of a plant medical service, according to programs outlined by the Council on Industrial Health of the American Medical Association and the American College of Surgeons, should include (1) the use of pre-employment and periodic physical examinations for proper placement of workers and the detection of remediable diseases; (2) the treatment of occupational diseases and injuries; (3) the reference of nonoccupational illness to the private physician; (4) the periodic inspection of the plant for environmental health hazards; (5) the maintenance of sickness records as a guide to the establishment of preventive measures; and (6) the health consultation and education of workers individually and as a group.

The physician should be engaged to spend a stipulated amount of time in the plant, the amount to be determined by the management and the physician. It has been suggested that as a minimum the physician should spend one hour a week in the plant per 100 workers.

Postgraduate Training Offered

Various types of postgraduate training in industrial hygiene have been offered in the different states. Indiana has offered a two-day conference on industrial health to be followed by a three weeks' intensive training period for those interested in entering industrial practice. The Michigan plans provide for three weeks of laboratory and practical experience. Iowa, Illinois, California, West Virginia, Massachusetts, and Ohio have presented a number of one-day institutes on industrial health in various cities throughout the states. The Long Island College of Medicine, Brooklyn, held a ten-day course of lectures and clinics in industrial medicine followed by a one-month industrial "internship."

(Continued on page 738)

Minneapolis Surgical Society

Meeting of March 4, 1943

President, Richard R. Cranmer, M.D., in the Chair
Secretary, R. F. McGandy, M.D.

SEED IMPLANTATION SKIN GRAFTS

H. O. McPHEETERS, M.D.
Minneapolis, Minnesota

The implantation of small bits of skin into granulation areas commonly spoken of as "seed implants" is a procedure not used as much and as often as it could and rightfully should be. This method is used for the covering of raw surfaces that are not adaptable to the use of the full or split thickness skin graft in which we would expect immediate healing and taking. It is for that reason that I feel it deserves more attention than it has had in the past.

The longer any raw surface is entirely devoid of skin and skin cells, the more fibrosis develops. Dr. S. L. Koch has taught and demonstrated that fibrosis continues until the granulation area is covered with epithelium or firm scar tissue. This fibrosis continues to draw the skin edges together and to pile up fibrous tissue elements in the granulating area, thus forming the dense scar bands we so often see in cases with total loss of skin with healing without skin grafting. We must have skin cells to proliferate in these areas.

The use of seed implants is particularly adaptable in case of large raw areas such as we see after injuries, burns, compound fractures, and varicose ulcers of the lower legs. It is often useless to do a dermatone split thickness graft in these cases due to the infection present but you can go right ahead and use your seed implants with impunity and can expect to have many islands of new skin growing in ten to twelve days.

If the case is a badly infected one with much edema and cellulitis then it is wise to put the patients to bed with the part in high elevation and apply hot wet packs widely over the area for a few days to get the general infection under control. It is also better to have the coarse watery granulation compressed to the firm red vascular type by the use of the fine mesh gauze and pressure bandages.

The case presented here is that of a man, aged fifty-two, a mechanic, in general good health. He developed a deep phlebitis in the right leg thirty-five years ago following pneumonia. Thirty-three years ago he developed an ulceration on the internal surface of the lower right leg and this has recurred off and on at intervals ever since. It has never been completely healed for the past six years. At the present time his leg is so bad that he has had to give up work entirely and is bedridden due to the severe pain in the leg when he tries to be about.

Examination showed the entire right extremity larger than the left. The lower leg was almost twice normal size. There was an extensive ulceration with irregular edges covering most of the lower half of the lower leg. The ulceration was deep and clearly through all the skin layers. Anteriorly it measured seven inches and extends about the left with only two and one half inches of the skin not destroyed. The ulcerating area was very necrotic and some gangrenous tissue was present. It was badly infected and there was much watery discharge from the surface. The entire lower leg was inflamed and showed a general cellulitis. The patient was toxic.

After six days in bed with hot wet packs from the toes to the groin, with the leg in high elevation, the infection was under control. A very tight Ace bandage was then applied over the fine meshed gauze dressing and the patient would walk real fast at intervals for one hour at a time every four hours, and the rest of the time he would be back in bed with a re-application of the hot packs. In this way the infection was controlled, the granulations were compressed flat and firm, and the circulation in the lower leg was markedly improved by the muscular activity. On the eighth day 240 seed implants were taken and buried into the granulation area. These were buried with a sliding technique into the granulations and about 1/32nd of an inch deep. They could be seen through the overlying granulations. During this implantation the lower leg was held high in the air being tied up so as to lessen the serous oozing from the raw area. *This is of much help.*

Tight compressive bandages were applied immediately postoperatively and the leg left in high elevation with hot packs for twenty-four hours, and then the patient resumed his walking for one hour every four hours. On the tenth day he went home and continued the same treatment from 7 a.m. to 11 p.m. On the fifteenth day the area was dressed daily with a bland ointment but otherwise the same. The entire area was healed and the patient returned six weeks from the date I first saw him.

The patient will, in all probability, have to wear the supportive bandage all his life. He must be careful to avoid trauma and injuries to the leg as it cannot survive trauma as the normal leg could. With this simple care and attention he will continue at work and will make a living for his family as he did in happier days.

Discussion

DR. CHARLES E. MERKERT: I remember when I was working with Dr. McPheeters in 1932 we were doing this then. We used a little tweezer to put in the grafts at that time rather than the needle. The needle technique is an improvement. I have never seen it before and it is something I find very interesting. We had good

takes in 1932 with a number of cases. It is better than trying to pull ulcers together and greatly shortens the time of healing.

Dr. Rudolph Hultkrans: I would like to ask Dr. McPheeters if he uses the pinch graft on the surface at any time, that is, a graft taken in about the same way, perhaps a little larger and leaving it on the surface.

Dr. Kenneth Bulkley: Dr. McPheeters has raised the question of pyocyaneus infection. Are there any new ideas of cleaning up such infections in these granulating areas?

Dr. H. O. McPheeters: The pyocaneus infection is the most destructive of all infections for skin grafts. I try to clear it up before any attempt at grafting is done. The seed implants will grow if the granulations are firm and vascular.

Dr. Kenneth Bulkley: If Dr. McPheeters will use 6 per cent acetic solution, I think his cases will clear up more rapidly.

GANGLIA OF THE JOINT CAPSULES AND TENDON SHEATHS

HARVEY NELSON, M.D.
Minneapolis, Minnesota

A ganglion as such is not a particularly important clinical entity, but for some reason or other we have had the opportunity of seeing an unusual number of ganglia during the last several years, and as the result of these observations, some of our own ideas regarding ganglia have changed and we have been able to decide on a specific mode of treatment, which has given results that appear to be quite satisfactory. These observations and conclusions may or may not add anything new or of surgical value, but at any rate a review of the subject should be of interest in view of the relative frequency of this condition.

Definition.—A ganglion may be defined as a cystic swelling, unilocular or multilocular, in the neighborhood of a joint or tendon sheath, and consisting of a dense fibrous tissue wall with a secreting lining composed of, or similar to synovial membrane, and containing a clear, jelly-like colloid material or a thick mucinous fluid.

Pathology.—Microscopically the ganglion that usually has reached a stage where surgical removal is done, presents a wall in which the lining membrane closely resembles the synovial membrane of joints. At this stage, the blood supply of the ganglion wall is poor with some of the vessels showing fibrosis and narrowing of the lumen, suggesting that a vascular lesion might be the origin of a degenerative process. It has been described that earlier stages in the development of a ganglion show a large number of spheroidal cells closely packed together and gradually merged into peripheral spindle cells. It has also been described that later a central area appears in which the spheroidal cells undergo mucoid changes, and a central cavity then develops partly filled with a secretion from these cells.

Some claim that there usually is no direct communication with the joint or tendon sheaths, but our observations do not substantiate this.

In our experience, ganglia are by far most common on the dorsal aspect of the wrist, next on the volar aspect of the wrist, next in the flexor tendon sheath at the palmar base of the fingers, and next in order and much less frequent on the dorsum of the distal interphalangeal joints of the fingers, the dorsum of the arch of the foot and about the knee joint. I do not recall now that we have observed any ganglia elsewhere. The ganglia about the wrist may arise either from the wrist joint capsule or the tendon sheaths of the extensor tendons on the dorsal side, or of the flexor carpi radialis on the volar side. It was originally our impression that the majority of these ganglia about the wrist arose from tendon sheaths. However, our present experience is just the opposite, and I would say at least 75 per cent of the ganglia that we have treated surgically have arisen from the wrist joint capsule. The ganglia at the palmar base of the fingers appear to develop from the flexor tendon sheath overlying the metacarpophalangeal joint, whereas those over the dorsum of the distal interphalangeal joint, in our experience, have communicated with the distal interphalangeal joint cavity. Those on the dorsum of the foot usually appear to develop from the intertarsal joints, although we have had several that were connected with the extensor tendon sheaths. We have seen two cases with ganglia associated with the biceps tendon and located at the lateral aspect of the popliteal space. They have also been described as arising from the region of the patellar ligament, but we have had no experience with this particular location other than one case three years ago in which a ganglion underneath the patellar ligament was diagnosed clinically but at the time of operation was found to be a xanthoma, which, of course, may also arise from tendon sheaths. I recall one other interesting case which probably should not be classified in a group of ganglia but which resembles, in a sense, the development of a ganglion and was originally diagnosed as such. This patient had a fusiform fluctuant swelling 2x1.5 inches on the palmar aspect of the wrist with also, some thickening of the proximal half of the palm. At operation, this mass in the wrist was found to communicate with the palmar space by a narrow duct-like channel extending beneath the annular ligament of the wrist. Its lining looked like and was continuous with the synovial membrane of the palmar space but was filled with rice bodies and villi, as was also the palmar space. Microscopically, no diagnosis could be established other than that the specimen showed degenerate tissue with areas of chronic inflammation. There was no recurrence of the ganglion-like mass in the wrist, but the palmar space continued to drain, gradually diminishing for about ten months. A secondary exploration of the palmar space about seven months after the first procedure showed a complete disappearance of the villi and rice bodies. However, sections from the then draining sinus showed masses of fibrous tissue and some fat with a few pieces of stratified squamous epithelium infiltrated by pus and lymphocytes.

One of these pieces showed a few giant cells which suggested the possibility of tuberculosis. The entire process now appears to be arrested with, however, some restriction of flexor tendon function.

Etiology.—I do not believe that anyone has definitely established the etiology of ganglia. Some observers contend that the pathogenesis in all cases is probably traumatic and that a herniation of the synovial membrane occurs through an area of weakness in the joint capsule or tendon sheath. Carp and Stout believe that "A mucinous degeneration occurs in the dense connective tissue adjacent to joints and tendon sheaths which affects the collagen in a number of isolated but closely approximated areas, and as a result, a series of small cysts arise which later coalesce to form the larger cyst containing mucin." They contend that these do not primarily communicate with joint spaces or tendon sheath spaces. King states that the process is not primarily a degeneration of cellular tissue, but a secretion of the synovial cells and that trauma and a constitutional factor are the chief causes.

Obviously no one as yet has established the etiology, and our attempts to explain the cause of ganglia are primarily theoretical explanations of the pathology after it has become established. We have had cases which mechanically at least would appear to be definite herniations of a tendon sheath or joint capsule, and cases, furthermore, particularly involving the tendon sheath, which would appear to be definitely traumatic in origin. We have also had a number of cases where a long narrow tract connects a bulbous ganglion with a joint capsule in such a manner that it hardly would suggest a mechanical herniation as we ordinarily understand it. One thing we have established in all our cases is a definite communication between the ganglion and the tendon sheath or joint capsule, although in a few of these cases it was not certain that this communication was patent. Careful dissection, in other words, has revealed in all our cases that there has been a tract between the subcutaneous ganglion and the joint capsule. In ganglia arising from tendon sheaths, this, of course, can easily be established. I believe that this is a most important factor, and I believe, furthermore, that if we arbitrarily accept the statement that ganglia "do not primarily communicate with joint spaces or tendon sheath spaces," our surgical procedure is going to be inadequate and a certain number of recurrences will result. It is on the basis of the fact that we have proven to our satisfaction that the tendon sheaths and joint capsules are involved, that we have decided on our present procedure of not only removing the ganglion and the ganglion tract but a portion of the sheath or joint capsule as well.

We have recently had a case in point. About two years ago, this girl had a sizeable ganglion on the dorsum of her wrist with a patent tract which extended down to the wrist joint capsule between the radius and scaphoid bone. This was dissected out and the tract tied off at its point of origin in the joint capsule. Within three or four months, she had had what appeared to be a recurrence of this ganglion, and the ganglion eventually developed to a size greater than the original one for which she was operated. A second operation disclosed, first, a multilocular subcutaneous ganglion with a tract which could be identified with some difficulty, extending apparently through the site of the previous tract as it was located in the vicinity of operative scar tissue. This was dissected down to the wrist joint capsule. Adjacent to the origin of this ganglion tract but entirely separated from it were two independent incipient ganglia which could be definitely identified as communicating with the joint cavity. In this case, we had both advanced and early ganglia in the same case where definite communication with the wrist joint cavity could be established. I wonder whether in some of these cases, where a patent communication between a ganglion and a joint cavity or a tendon sheath cavity cannot be established, if the original tract may not have become obliterated or stenosed.

From a practical standpoint, it is probably only of academic interest whether the process of ganglion development begins external to the synovial membrane and does not communicate with the joint space or tendon sheath space, or whether the origin is within the capsule or sheath and an actual communication is present. I believe that it is not only necessary to remove the ganglion as such but also to always remove the ganglion tract and a portion of the capsule or sheath from which it apparently arises as well.

Most of our cases were in women, and most of the cases in men were not in men doing a manual type of labor. This suggests that there is some constitutional factor or possibly a local structural change rather than a true traumatic etiology in the majority of cases. My own impression is that there are some cases of ganglia developing from herniation secondary to trauma but that this is more common in tendon sheaths than in joint capsules. It is also my opinion that structural or cellular changes at least predispose toward the development of ganglia, particularly in those arising from joint capsules.

Diagnosis.—Clinically the diagnosis of ganglia in the average case is obvious. A localized, rounded and smooth swelling, occasionally visibly multilocular, which is tense but not hard is found usually over the dorsal aspect of the wrist, sometimes over the palmar aspect of the wrist and occasionally over the dorsum of the arch of the foot or the regions of the tendons in the popliteal area. They become more prominent when the area is stretched by flexion or extension as the case might be. Pain is not a major factor, but there usually is some tenderness and there frequently is a feeling of weakness. They may be confused with some of the softer types of tumors or in some locations a bursitis. The ganglia found in the flexor tendon sheaths at the palmar base of the fingers are hard and bead-like in character and usually have to be felt rather than seen. The ganglia on the dorsum of the distal interphalangeal joints are also localized, tense but not hard swellings similar in character to those found in the wrist joint but, of course, small.

Treatment.—One only has to review the literature to gain the impression that ganglia are one of those

comparatively minor conditions which are seen frequently and for which a number of different methods of treatment have been recommended without uniform success. The time-worn method of breaking the ganglion by a forceful blow, or firm pressure with the thumbs still is used and in some cases is successful, although I can hardly conceive of this method being permanently successful other than in the simple ganglion of a tendon sheath. Many years ago, Seton recommended the insertion of a thread through a ganglion, and modifications of this method are still used with the theory being that an aseptic reaction is induced, which obliterates the cyst by granulation tissue. Cases of reported cures are given in the literature by simple aspiration of the ganglion with a large bore needle and the subsequent application of a compression bandage for twenty-four or forty-eight hours. Gould advises the insertion of a narrow scalpel or pointed tenotome through the skin and through both sides of the ganglion wall with a subsequent dispersion of the jelly-like contents by pressure of the fingers. The injection treatment of ganglia is of long standing with the earlier injected materials being iodine and carbolic acid. In 1930, McEvedy advocated the injection of sodium morrhuate after aspiration of the ganglion, and this treatment is still used and advocated frequently. Gunther has injected collodion in this manner with good results. Recently Lyle reported a number of cases treated by x-ray radiation at the Presbyterian Hospital and claimed approximately 80 per cent good results.

For our own part, it would seem that the advisable treatment at least in the majority of cases that come to the surgeon is complete excision. Conservative measures certainly are not objectionable in the early ganglia, but in our experience the majority of patients do not come in until they have had the ganglion for some time and the condition is quite well developed. Since our cases indicate that a majority of the ganglia about the wrist joint communicate with the wrist joint and that our operative findings actually demonstrate a communication with the wrist joint, we have hesitated to inject sclerosing solutions. We feel, furthermore, that operative excisions accomplish the highest percentage of cures and can be done with a minimal period of hospitalization and disability. We have found the average patient to be much more satisfied with an operative removal of the ganglion than with conservative measures.

The operative procedure might be described as being a minor operation with a major technique. In our opinion, the procedure should be done under a general anesthetic and under a tourniquet. Rigid aseptic technique is necessary because of the frequent need of exposure of tendons and joint surfaces. We always insert a small amount of sulfanilamide in the wound before closure. In ganglia of the wrist joint area, we prefer horizontal incisions which give adequate exposure and a minimal scar. Longitudinal incisions usually leave a scar which spreads considerably and becomes quite conspicuous. Careful dissection is necessary to avoid rupturing the ganglion and to avoid injury to the adjacent tendons. On the volar surface of the wrist, ganglia are frequently in the neighborhood of the radial artery and nerve and even the median nerve. We have found it of distinct advantage to avoid rupturing the ganglion until its stem or point of communication with the joint capsule or tendon sheath has been identified and dissected free. Failure to do this, I believe, in many cases, has concealed the actual origin of the ganglion and particularly in those cases which have a duct-like communication extending down to the wrist joint. In too many cases, it has been assumed that all of the ganglion had been dissected free or that it communicated in some manner with a tendon sheath, whereas the actual communication, which was with the wrist joint, had been severed and left in site to permit a future recurrence of the ganglion. Some time ago we made a practice of tying off or closing the base of a ganglion with a suture of catgut. This I now believe is a mistake, and in this respect, at least, a ganglion should not be considered in the light of a hernia. It is not necessary to "tie off the sac." Observations have shown that there are some structural changes in the joint capsule or tendon sheath at the site of the origin of the ganglion and even in the neighboring area. Assuming that there is some histological change within the region of or in the capsule or tendon sheath itself which causes or permits the development of at least some of these ganglia, it is important to remove this tissue to prevent future recurrence. We have, therefore, found it advisable to not only carefully dissect out and remove the entire ganglion and its entire communicating tract but also a portion of the joint capsule or tendon sheath as well. No attempt at any closure of this defect should be made. We have had one case where it was necessary to remove an area of the joint capsule ¼ inch to ⅜ inch in diameter before normal capsule was encountered. In spite of this, this patient's convalescence was remarkably free of pain and swelling. No ill effects seem to occur from removal of a section of joint capsule or tendon sheath and leaving this excised area open. Postoperatively we have preferred to apply a small palmar plaster splint for two weeks to immobilize the wrist. With this support, there is a minimum of discomfort and healing is probably assisted. The majority of these cases only lose a few days from work.

Conclusion

In conclusion, we would like to emphasize the fact that although ganglia offer comparatively minor problems, they are nevertheless fairly common clinical entities for which the patient seeks symptomatic and cosmetic relief and as such are entitled to careful surgical consideration and treatment. In the region of the wrist joint, it is our opinion that a much higher percentage of ganglia communicate with the wrist joint or wrist joint capsule than is commonly believed. We feel that the method of treatment of choice is surgical excision which should be done most carefully so as to include all of the ganglion, the communicating ganglion tract and a portion of the joint capsule or tendon sheath from which the ganglion develops, without any attempt to close this defect. Whether a ganglion develops as

a herniation, from some structural change in the synovial membrane, or from some degenerative process in the adjacent connective tissue makes no practical difference in the treatment as the communication between the ganglion and the joint capsule or tendon sheath can usually be established and when established should be completely excised. We have noticed no ill effects from not closing the resulting defect and on the contrary it facilitates the procedure and results in less postoperative reaction.

Discussion

Dr. Charles E. Merkert: I should like to ask Dr. Nelson whether the "tennis elbow" is ever a ganglion, or is it always a bursitis or myositis?

Dr. Harvey Nelson: We have operated on a number of individuals with so-called "tennis elbow" which is, I believe, either a bursitis or tenosynovitis located usually in the vicinity of the lateral condyle of the humerus. The primary symptom here is pain, particularly on grasping objects or rotating the forearm with force, such as in using a screw driver, lifting, or some similar effort. We have had a few cases where we felt that a small mass or lump could be palpated. In the majority of cases, however, there is no well defined sac, such as we find in a ganglion. It has been our experience that in those cases of "tennis elbow" that we have operated upon, we have found no ganglion, and relief is usually obtained by stripping the fascia off from the lateral condyle of the humerus and making a few longitudinal incisions through the tendonous attachment in this area.

Dr. Stanley R. Maxeiner: I should like to call attention to a procedure which has helped us on more than one occasion and which, I believe, was originally described by Murphy. When the sac is ruptured it may be packed with moist cotton and reëstablished so that its entire outline may be more easily followed and dissection is thus greatly simplified.

UNUSUALLY SEVERE FACIAL INJURY

KENNETH BULKLEY, M.D.
Minneapolis, Minnesota

This case is presented with apology and only because the presentation was specifically requested by a number of our members who saw the patient on admission. Possibly it is of value as illustrating or emphasizing two points: (1) the remarkable efficacy of the sulfa drugs; and (2) the fact that, even though damage seems irreparable, it can be worthwhile to painstakingly make an effort.

This man, forty-two years of age, was admitted to Northwestern Hospital on September 4, 1942, with extensive facial damage, presently to be described, more revolting in its appearance and more hopeless from the viewpoint of repair than anything I have seen since the days of shell-torn faces in France. He was working at the time of his injury, lying on his back on the ground, when a huge piece of structural steel swinging on a crane tilted and crushed his face. Strangely enough he was at no time unconscious and despite the extensive damage and hemorrhage at no time did his condition become such that a transfusion was necessary. On admission this man was found to be practically scalped. There was a lacerated wound beginning in the right upper forehead, extending just above the ear to end to the left of the occiput, the entire flap being thrown over the top of his skull. This flap included periosteum, and in the exposed right parietal area there was a long linear skull fracture without depression. The entire wound was ground in deeply with dirt, iron-rust and coal. There was a large "V" shaped scalp wound just above the left ear, each limb of which was about 3 inches in length; this also was filthy. The lower jaw was not fractured. The entire face above this was crushed in and loose so that one could grasp the upper teeth and move the superior maxillæ in any direction. The upper alveolar margin was intact. The nose was crushed flat and torn wide open at it base. Both nasal bones and the bony portion of the septum were lying loose on the skin of his left cheek; they were discarded. One could insert three fingers between the eyes through the base of the nose directly into the nasopharynx. From this opening there extended a wound the entire length of the left eyebrow, pulverizing the outer two-thirds of the supra-orbital ridge and pushing the entire upper eyelid downward exposing the left eyeball, which lay forward over the edge of the infra-orbital ridge. The ridge was depressed and driven in on both sides with the maxillæ. The superior oblique was torn loose from the eyeball and one could look directly into the retro-orbital space and see the stretched optic nerve. From the viewpoint of repair the situation presented was most discouraging. Fortunately I did not remove the eye, though such was my impulse. Something had to be done, however, and, accordingly, under intravenous sodium pentothal anesthesia repair was started. It was necessary to put a stitch through the tongue to prevent choking and not until four days later was it possible to remove this. The scalp was not even shaved. It was merely roughly clipped with scissors. No antiseptic of any sort, such as we used to know, was used in any of his wounds. His skull and the ripped-off portion of scalp were thoroughly scrubbed with large quantities of soap and water. Much of the ground in dirt, however, was still in place when his scalp was replaced. The entire scalp was replaced and sutured, with no drains whatsoever, after the insertion of large quantities of sulfanilamide. Only minimal débridement was done. As already stated, both nasal bones and the bony portion of the septum of the nose were discarded. The eyeball was replaced in the socket, the orbit was filled with a large quantity of sulfanilamide, the superior oblique was tucked back into position, and the left supra-orbital laceration, together with the defect at the base of the nose, closed. I was most fearsome of getting a blowing sinus at this area, such a sinus being difficult to later repair. It was possible to replace the superior maxillæ fairly satisfactorily but it was totally impossible to hold them in place inasmuch as a Waldron head plaster could not be immediately applied because of the extensive scalp wounds. Furthermore, it seemed highly improbable that this man would live. He was returned to bed in fair condition without the necessity for transfusion but the necessity for twenty-four-hour nursing to prevent suffocation. Forty grams of sulfanilamide

in all were buried in this man's wounds and every wound healed by primary union and no blowing sinus was obtained at the root of the nose. At no time were there any indications of sulfanilamide poisoning. Unfortunately no blood level readings were made. His healing was so prompt that ten days later it was possible to remove all dressing from his head, to remove all stitches and put a universal Waldron head-cast in place. With the assistance of Dr. Patterson, twelve days after this man was hurt, he was again anesthetized, screws were placed in his superior maxillæ and his upper jaws brought into place and there maintained by the usual complicated, somewhat difficult, methods so cleverly devised by Dr. Waldron.

As already stated, I present him tonight to show the value of enormous amounts of buried sulfanilamide and to show you a man who, although badly scarred, is not deformed to the extent that he cannot meet the public and earn his livelihood and be a normal member of society—and this despite his original appearance which seemed hopeless. For some little period of time this man had double vision. You will note now, however, that his eyes track perfectly and even though his left optic nerve was terrifically stretched he is regaining normal vision in his left eye. There was no hemorrhage within the ball. His teeth occlude beautifully, so that, as he, himself, says, he is able to do justice to a tough steak. Due to the extensive damage at the base of his nose he has been having difficulty with his lacrymal sacs and both of these will in the near future be removed. He has no complaint of headaches or dizziness. He is now, only five months after injury, ready to return to work as an expert structural iron worker.

NEW SULFA TRIUMPHS OVER SCARLET FEVER, EYE DISEASE

Two new sulfa drug triumphs are among major medical advances reported in the *Journal of the American Medical Association* (July 10).

A relatively new sulfa drug, called sodium sulfathiazole desoxyephedrine and originally developed for nasal infections, greatly speeds recovery in the first, acute stage of shipyard eye (epidemic keratoconjunctivitis), Dr. Harry S. Gradle, of Chicago, and Dr. G. H. Harrison, of Waukegan, Ill., report. Instead of lasting from fourteen to eighteen days, as it does in untreated cases, the first stage of this disease was reduced to from three to seven days with the new treatment.

Small daily doses of sulfadiazine effectively controlled an outbreak of scarlet fever at a U. S. Naval station, Lieut. Robert F. Watson, Lieut. Comdr. Francis F. Schwentker, Comdr. J. E. Fetherton and Dr. Sidney Rothbard, of the U. S. Navy Research Unit at the Hospital of the Rockefeller Institute, New York, report. They state that there is now enough evidence to justify the use of this drug in controlling epidemics not just of scarlet fever but "of streptococci infections of the respiratory tract."—*Science News Letter,* July 17, 1943.

Rabies has been eliminated or kept out of Great Britain, Sweden, Switzerland, Australia and Hawaii; the United States has some 9,000 cases a year, mostly in dogs, which could be prevented by proper measures.

INDUSTRIAL HEALTH

(Continued from Page 732)

A register of 150 physicians interested in extending their practice in industry has been established in the school.

In Minnesota, there is developing a greater consciousness of the industrial importance of the state and a growing recognition of the responsibility to protect the health of the industrial worker. This has been reflected to some extent by the passage of recent legislation providing for the compensation of all occupational disease and the establishment of certain standards of safety and health in the workroom environment. This legislation in turn will stimulate a greater desire on the part of management to provide more adequate medical service and to control industrial health hazards in the plants.

Minnesota Men Needed

The need for a list of Minnesota physicians interested in industrial practice is being felt more and more keenly. Repeated requests for names of such physicians have come to the Division of Industrial Health of the State Department of Health. With this in mind, the Committee on Industrial Health of this Association at its last meeting decided to conduct a survey of the physicians of the State to determine what physicians are interested in industrial practice, on what basis, such as full-time or part-time, and whether or not they are interested in attending a short course in industrial medicine. It is thought that if a sufficient number indicate interest, a two or three-day course could be arranged at the University of Minnesota. A questionnaire is being sent out to members of the Association in industrial areas. All are requested to be prompt in making reply by means of the self-addressed postcards which are provided.

PENICILLIN IN TREATMENT OF GAS GANGRENE

Penicillin, the potent germ-fighter from mold, is "far superior" to the sulfa drugs in the treatment of gas gangrene, Dr. Lucile R. Hac and Dr. Agnes C. Hubert, of Chicago, report (*Proceedings, Society for Experimental Biology and Medicine,* May).

Their report is based on laboratory experiments with mice and guinea pigs infected with Clostridium welchii, the germ most frequently found in cases of gas gangrene. A single injection under the skin of 50 Florey units of penicillin given at the time the gas gangrene germs were inoculated into the mice protected 98 per cent of the animals. Repeated small doses gave as good protection as single large doses. Delay in treatment lowers the survival rate, but not appreciably unless the delay is over three hours.—*Science News Letter,* July 17, 1943.

★ In Memoriam ★

JOHN L. ROTHROCK

Dr. John L. Rothrock, for many years a prominent obstetrician and gynecologist of Saint Paul, died July 5, 1943, at the Miller Hospital, Saint Paul, at the age of eighty.



JOHN L. ROTHROCK

Born on a farm near Mifflintown, Pennsylvania, July 12, 1863, Dr. Rothrock obtained his bachelor of arts degree at Gettysburg College and his medical degree from the University of Pennsylvania in 1888. He served as an intern at Wilkes-Barre and Philadelphia for two years.

After a year in private practice in Saint Paul he became assistant to Dr. Alexander J. Stone, a prominent Saint Paul surgeon. Two years later he spent a year and a half in postgraduate study of obstetrics, gynecology and bacteriology in Philadelphia, Baltimore and abroad. In 1894 he resumed practice in Saint Paul. In 1896 he was appointed assistant to Dr. Stone, who was city health officer, and he established the laboratory of the City Health Department. This office he filled for three years.

For many years he was on the teaching staff of the Medical School of the University of Minnesota, eventually becoming full professor. In 1913, after the death of Dr. Parkes Ritchie, he declined to head the department of obstetrics and gynecology.

Dr. Rothrock joined the Miller Clinic in 1921, but retired from active practice in 1930. In appreciation of his services to the Ramsey County Medical Society, a banquet was tendered him by the society at the Minnesota Club, Saint Paul, December 17, 1931. He was one of the moving spirits who were responsible in 1897 and 1898 in establishing the Ramsey County Medical Society Library.

Following his retirement he summed up his medical experience in a book entitled "Ten Years of Obstetrics and Gynecology in Private Practice," which appeared in 1933. He contributed numerous articles in the local medical journals in the early days.

Dr. Rothrock never married. He was a member of the Masonic order and the Reformation Lutheran Church. In 1941 he made a donation of $50,000 to his alma mater, Gettysburg College, and the following year gave a similar amount to the Northwest Lutheran Theological Seminary in Minneapolis.

Dr. Rothrock was an outstanding member of his profession in his specialty. He was a fine teacher, as many graduates of the University Medical School can attest. The younger members of the profession found him generous with his scientific knowledge. He never felt the need for an automobile and was a great walker, for a time spurning the elevator which served his office several flights up. His greatest joy was his visits to his cabin on Ruby Lake near Grand Rapids where he would entertain his friends, doing all the cooking and dish washing himself.

* * *

FRANK B. MORRISSEY

Dr. Frank B. Morrissey, Saint Paul, died June 16, 1943 at the Veterans Hospital, Fort Snelling, after an illness of about ten years.

Dr. Morrissey was born September 5, 1891 at Glen Haven, Wisconsin. He attended Beloit College in Wisconsin and received his medical degree from the University of Minnesota Medical School in 1918.

He served as first lieutenant in the Medical Corps during World War I and following the war was a major in the Minnesota National Guard.

Dr. Morrissey passed the American Board of Internal Medicine, was a fellow of the American College of Physicians, a member of the staff of Saint John's Hospital and was a member of the Ramsey County Medical Society, the Minnesota State and American Medical Associations. He was also a member of the American Legion and the Disabled American Veterans.

Following service in World War I he was associated in practice with the late Dr. Charles Lyman Greene and later with Dr. F. J. Plondke.

Dr. Morrissey is survived by his wife and two daughters, Mrs. Herman Berg and Barbara Morrissey, all of Saint Paul.

WILLIAM G. PARADIS

Dr. William G. Paradis for the past thirteen years the medical director of Sunnyrest Sanatorium, Crookston, Minnesota, died July 7, 1943, at his home near the sanatorium.

Dr. Paradis was born in Bessemer, Michigan, July 16, 1899. He received his medical degree from the University of Minnesota in 1926 and served his internship at Hackensack, New Jersey. In 1927 he became resident staff physician at Glen Lake Sanatorium serving for two years.

In 1929 Dr. Paradis went to Crookston as superintendent of the Sunnyrest Sanatorium, a position he held until his untimely death. He was a member of the staffs of Bethesda and Saint Vincent's Hospitals of Crookston and was a past president of the Minnesota Sanatorium Association. From 1941 to 1942 he held the office of president of the Red River Valley Medical Society. He was also a member of the National Tuberculosis Association and the American Sanatorium Association, the American College of Chest Physicians and the Trudeau Society. He was a member of the Red River Valley Medical Society, the Minnesota State and American Medical Associations.

Dr. Paradis was married in 1928 to Eleanor O'Day. His widow and two daughters, Virginia and Charlene survive.

* * *

ALBERT B. SWEET

Dr. Albert B. Sweet of Hopkins, Minnesota, died at the Veterans' Hospital, July 6, 1943, at the age of ninety-five. He would have been ninety-six on July 14.

Dr. Sweet was born July 14, 1847, in Walden, Vermont. He served with Company F, 4th Minnesota Volunteer Infantry and was wounded while accompanying General Sherman on his march to the sea.

After the war he taught school in Brown County, Minnesota, and in the blizzard of 1873 was credited with saving the lives of his pupils marooned with him in a school house for two days.

Dr. Sweet, also a graduate pharmacist, studied medicine at the University of Minnesota and operated a drugstore when he practiced at Hanley Falls, Minnesota. He was surgeon for the Minneapolis and Saint Louis Railroad in that territory.

He moved to Minneapolis in 1891 and practiced there until the following year when he moved to Hopkins. He retired from practice in 1922. Mrs. Sweet died in 1937.

GEORGE H. WALKER

Dr. George H. Walker, a member of the Winona Clinic since 1926, died July 2, 1943, at the age of sixty-three.

Dr. Walker was born in Halden, Missouri, January 5, 1880, and completed his high school training in Pawnee City, Nebraska. He received the degree of Bachelor of Science in 1902 from the University of Nebraska. He spent one year as state chemist for Nebraska and another year in the government assay office in Breckenridge, Colorado, before studying medicine at the University of Minnesota, where he graduated in 1908. Following his internship served at Saint Luke's Hospital in Saint Paul he began practice at Fairfax, Minnesota, remaining there from 1910 to 1921.

Dr. Walker took postgraduate work in eye, ear, nose and throat at the University of Minnesota, and in 1924-5 spent five months in Vienna. He was associated with the Miller Clinic, Saint Paul, from 1923 to 1926.

On January 25, 1911, he married Louise Feton of Saint Paul. He is survived by his widow and one son, Lieut. George L. Walker, medical corps of the army, now stationed in England, and one brother, J. E. Walker of Pawnee City, Nebraska.

Dr. Walker was a member of the Winona County Medical Society, the Minnesota State and American Medical Associations.

PLASMA CAN GREATLY AID CONDITIONS BESIDES SHOCK

Shock is not the only condition which can be helped by blood plasma, Dr. Max M. Strumia, of Bryn Mawr, Pa., told the American Society of Clinical Pathologists meeting in Chicago.

Dr. Strumia was selected by the society's general research committee for the 1943 Ward Burdick Award.

Plasma, he reported, can be of great aid in conditions unrelated to shock in which the body is holding water far in excess of the normal amount without visible dropsy. Patients in this condition, among whom may be many who have had operations on the stomach and digestive tract, are also generally in a state of protein depletion. The digestive tract itself may become dropsical, interfering with digestion and absorption of proteins.

Plasma, Dr. Strumia believes, may aid recovery in these patients.—*Science News Letter,* July 10, 1943.

Zemmer

PRESCRIBE or DISPENSE ZEMMER PHARMACEUTICALS

Tablets, Lozenges, Ampoules, Capsules, Ointments, etc. Guaranteed reliable potency. Our products are laboratory controlled. Write for catalogue.

Chemists to the Medical Profession

THE ZEMMER COMPANY, Oakland Station, Pittsburgh, Pa.

MIN 8-43



Such language!

My boss used to be as grumpy as a bear. He'd growl and bang around and his wife said: "Poor George, he's working too hard. It's wearing him down to a frazzle!"

So, I told her a few plain facts:

. . . how I'd discovered the most amazing thing . . . that physicians who prescribe S-M-A* actually have more time for other things . . . because it isn't necessary to change the formula throughout the entire feeding period. (She sat up at that.)

. . . how S-M-A eliminates many unnecessary questions that mothers usually ask about other modified milk formulas.



When I had finished, she said she would certainly speak to George about using S-M-A as a routine formula.

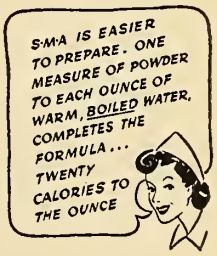
★ ★ ★

Just because my boss turned over a new leaf . . . he wants everybody to pat him on the back for it. But he's not fooling us . . . we know how he got to be such a nice man.

BUSY DOCTORS TODAY—PRESCRIBE S-M-A!

With the exception of Vitamin C . . . S-M-A is nutritionally complete. Vitamins B_1, D and A are included in adequate proportion . . . ready to feed. Their presence in S-M-A prevents the development of subclinical vitamin deficiencies . . . because the infant gets all the necessary vitamins right from the start.

S-M-A has still another highly important advantage not found in other modified milk formulas. It contains a special fat that resembles breast milk fat . . . resembles it chemically and physically—according to impartial laboratory tests. S-M-A fat is more readily digested and tolerated by most infants than cow's milk fat.



The infant food that is nutritionally complete

*REG. U. S. PAT. OFF.

SMA

ACCEPTED AMERICAN MEDICAL ASSN. Council on Foods

S. M. A. Corporation
8100 McCormick Boulevard
Chicago, Illinois

S-M-A, a trade-mark of S.M.A. Corporation, for its brand of food especially prepared for infant feeding—derived from tuberculin-tested cow's milk, the fat of which is replaced by animal and vegetable fats, including biologically tested cod liver oil; with the addition of milk sugar and potassium chloride; altogether forming an antirachitic food. When diluted according to directions, it is essentially similar to human milk in percentages of protein, fat, carbohydrate and ash, in chemical constants of the fat and physical properties.

AMERICAN CONGRESS OF PHYSICAL THERAPY

The American Congress of Physical Therapy will hold its twenty-second annual scientific and clinical session September 8, 9, 10 and 11, 1943, inclusive, at the Palmer House, Chicago. Rehabilitation is in the spotlight today—physical therapy plays an important part in this work.

The annual instruction course will be held from 8:00 to 10:30 A.M., and from 1:00 to 2:00 P.M. during the days of September 8, 9 and 10, and will include a round-table discussion group from 9:00 to 10:30 A.M., Thursday, September 9. The scientific and clinical sessions will be given on the remaining portions of these days and evenings. A feature will be an hour demonstration showing technique from 5:00 to 6:00 P.M. during the days of September 8, 9 and 10.

All of these sessions will be open to the members of the regular medical profession and their qualified aides. For information concerning the instruction course and program of the convention proper, address the American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago, Illinois.

CIVIL SERVICE EXAMINATIONS FOR MEDICAL GUARD-ATTENDANTS AND MEDICAL TECHNICAL ASSISTANTS

The Civil Service Commission has announced an examination to secure Medical Guard-Attendants and Medical Technical Assistants for the U. S. Public Health Service.

Applicants for *Medical Guard-Attendant* positions whichpay $1,970 (counting overtime compensation) a year must be registered graduate nurses, or have had at least three years' service in the Medical Corps of the Army or Navy, or have had eighteen months' service as hospital attendant-guards.

Applicants for the *Technical Assistant* positions which pay $2,433 a year (counting overtime compensation) must possess the qualifications for Medical Guard-Attendant and in addition must have had 1 year of training or experience in one of the following options: Clinical Laboratory Technique, Pharmacy, or X-ray Laboratory Technique.

Further information and application forms may be obtained at first- or second-class postoffices, Civil Service Regional Offices, and the Commission in Washington, D. C.

FALL CLINIC SCHEDULE

The Division of Social Welfare Medical Unit of the Bureau for Crippled Children has announced its Fall Clinic Schedule for 1943 as follows:

September 11—Winona. Counties of Winona, Wabasha, Olmsted, Fillmore and Houston.

September 18—Fergus Falls. Counties of Ottertail, Wilkin and Wadena.

September 25—Marshall. Counties of Lyon, Lincoln, Redwood, Yellow Medicine, and Lac qui Parle.

October 2—Bemidji. Counties of Beltrami, Lake of the Woods, Clearwater, and Hubbard.

October 16—Virginia. Counties of St. Louis, Cook, and Lake.

October 30—Crookston. Counties of Polk, Norman, and Mahnomen.

November 6—Little Falls. Counties of Morrison, Todd, Crow Wing, and Mille Lacs.

November 13—Mankato. Counties of Blue Earth, Martin, Faribault, Waseca, Brown, Watonwan, Nicollet, and Le Sueur.

MINNESOTA HOSPITAL ASSOCIATION

Rev. L. B. Benson of Bethesda Hospital, Saint Paul, succeeded to the presidency of the Minnesota Hospital Association this year, having been chosen president-elect in 1942. The following officers were elected to serve with him:

First Vice President—Dina Bremness, R.N., Glenwood.
Second Vice President—Sister Viola, Little Falls.
Trustee (1944)—J. H. Mitchell, Rochester.
Trustee (1944)—Dr. Thomas Broadie, Saint Paul.
Trustee (1945)—Sister Anna Berglund, Minneapolis.
Trustee (1945)—W. W. Sherman, Grand Rapids.
Immediate Past President—Dr. Walter P. Gardner, Anoka.
Executive Secretary—Dr. A. F. Branton, Willmar.

The matter of the president-elect was left for decision later on in the year.

MISSISSIPPI VALLEY MEDICAL SOCIETY

The ninth annual meeting of the Mississippi Valley Medical Society will be held at Quincy, Illinois, September 29 and 30, 1943.

Some twenty clinician-teachers will present the program, the first day being an All-Chicago program with a stag buffet supper in the evening. The annual banquet, a feature of the meeting, will also be held. The list of speakers includes Brigadier General Fred W. Rankin, Dr. George W. Post, Dr. Warren H. Cole and Dr. Paul B. Magnuson of Chicago, Dr. John de J. Pemberton and Dr. Samuel F. Haines of Rochester, Minnesota, Dr. Willis M. Fowler of the University of Iowa and Dr. Julius Jensen of Washington University.

The program will be practical in nature and will be keyed to wartime medicine. All ethical physicians are invited to attend. A program may be obtained from the secretary, Dr. Harold Swanberg, 209 W. C. U. Building, Quincy, Illinois.

NORTHERN MINNESOTA MEDICAL ASSOCIATION

The annual meeting of the Northern Minnesota Medical Association will be held in Duluth, Minnesota, Saturday, August 28, 1943, with scientific and business sessions at St. Mary's Hospital. Following is the tentative program for the meeting:

Morning Session—9:00 A.M.

Relation of Dentistry to Eye, Ear, Nose and Throat
JOSEPH B. GAIDA, M.D., St. Cloud
Management of Hand Injuries
R. F. MUELLER, M.D., Two Harbors
Polycythemia Vera, Diagnosis and Treatment
R. J. HODAPP, M.D., Willmar
Modifications in Methods of Intravenous Anesthesia
J. S. LUNDY, M.D., Rochester
Discussion of the Sulpha Compounds
W. W. SPINK, M.D., Minneapolis
Diagnosis and Prognosis in Cancer of Rectum and Colon
W. A. FANSLER, M.D., Minneapolis.
Obstetrical Problems
R. J. MOE, M.D., Duluth
Status of Retrograde and Intravenous Pyelography
WALTER E. HATCH, M.D., Duluth

Luncheon Banquet—12:30 P.M.

Hotel Duluth

Speaker—A. W. Adson, M.D., Rochester
"Current Economic Problems"

Afternoon Session—2:00 P.M.

Clinico-Pathological Conference—
E. L. TUOHY, M.D., ARTHUR H. WELLS, M.D., J. R. McNUTT, M.D., FRED MAGNEY, M.D., A. J. SPRANG, M.D., GEORGE BERDEZ, M.D., AND J. E. BLUMGREN, M.D., Duluth
Medical Problems of Selective Service and the Army
LT. COL. ROBERT B. RADL, Saint Paul

Business Meeting—5:00 P.M.

A cordial invitation is extended to all interested physicians to attend this one-day session.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

The annual meeting of the Southern Minnesota Medical Association will be held Monday, August 23, 1943, in Austin, with scientific sessions in the Austin Central High School.

Morning Session—9:00 A.M.

The Isolation from Milk Supplies and the Thermal Death Point in Milk of Specific Types of Streptococci in Relation to Respiratory and Other Epidemic Infections
E. C. ROSENOW, M.D., Rochester
Intrapleural Pneumolysis
KARL H. PFUETZE, M.D., Cannon Falls
The Use of Anticoagulant Drugs, Heparin and Dicumarol, in Medicine and Surgery
NELSON W. BARKER, M.D., Rochester
Abruptio Placenta
ROY N. ANDREWS, M.D., Mankato
Clinical Experience with Bilateral Orchidectomy in the Treatment of Carcinoma of the Prostate
JOHN L. EMMETT, M.D., Rochester
Duhrssen's Incisions
D. E. MOREHEAD, M.D., Owatonna
Myasthenia Gravis (Motion Picture)
SECTION ON NEUROLOGY, MAYO CLINIC
Weakness. A Round Table Discussion
E. J. KEPLER, M.D., Rochester; J. C. McKINLEY, M.D., Minneapolis; C. R. KAMMAN, M.D., Saint Paul; C. KOENIGSBERGER, M.D., Mankato

Luncheon and Business Meeting—12:15 P.M.

POSTPARTUM BACKACHE

often averted by prescribing a

SPENCER

Maternity Support

for wear during pregnancy

Orthopedists tell us that they are noting an increasing number of postpartum back cases, particularly among primaparas.

Young mothers, unaccustomed to baby care and the physical exertion of home-making, are often handicapped by weakened back and abdominal muscles. Lifting of the child, bending and stooping, plus postpartum fatigue, induce back derangements.



Patient with 5 months' development wearing an Individually Designed Spencer Maternity and Breast Support. Usable after childbirth, too!

By wearing a Spencer Support during pregnancy, designed especially for her, the patient is protected against undue fatigue and back strain before and after childbirth.

A light, flexible Spencer Maternity Support will be individually designed for your patient. It will provide support for lower abdomen, with freedom at upper abdomen; improve posture; relieve pressure; prevent and relieve backache and nausea when not pathological. Designed of non-elastic material. *Guaranteed* never to lose its shape. Easily adjusted to increasing development.

Spencer Supports are never sold in stores. For a Spencer Specialist, look in telephone book under "Spencer Corsetiere" or write direct to us.

SPENCER *INDIVIDUALLY DESIGNED*

Abdominal, Back and Breast Supports

SPENCER INCORPORATED,
137 Derby Ave., New Haven 7, Conn.
In Canada: Rock Island, Quebec.
In England: Spencer (Banbury) Ltd., Banbury, Oxon.

May We Send You Booklet?

Please send me booklet, "How Spencer Supports Aid the Doctor's Treatment."

.....M. D.

Address O-8

PROFESSIONAL PROTECTION

SINCE 1899 SPECIALIZED SERVICE

In addition to our Professional Liability Policy for private practice we issue a special

MILITARY POLICY

to the profession in the Armed Forces at a

REDUCED PREMIUM

THE

MEDICAL PROTECTIVE COMPANY

OF

FORT WAYNE, INDIANA

Cook County Graduate School of Medicine

(In Affiliation with Cook County Hospital)

Incorporated not for profit

ANNOUNCES CONTINUOUS COURSES

SURGERY—Two Weeks' Intensive Course in Surgical Technique starting August 9, August 23, September 6, September 20, and every two weeks throughout the year.

MEDICINE—Two Weeks' Intensive Course starting October 4. Two Weeks' Course in Gastro-Enterology starting October 18.

FRACTURES & TRAUMATIC SURGERY—Two Weeks' Intensive Course starting October 18.

GYNECOLOGY—Two Weeks' Intensive Course starting October 18. Clinical and Diagnostic Courses.

OBSTETRICS—Two Weeks' Intensive Course starting October 4.

OPHTHALMOLOGY—Two Weeks' Intensive Course starting September 27. Course in Refraction Methods, October 11.

OTOLARYNGOLOGY—Two Weeks' Intensive Course starting September 13.

ROENTGENOLOGY—Courses in X-ray Interpretation, Fluoroscopy, Deep X-ray Therapy every two weeks.

UROLOGY—Two Weeks' Course and One-month Course available every two weeks.

CYSTOSCOPY—Ten-day Practical Course every two weeks.

General, Intensive and Special Courses in All Branches of Medicine, Surgery and the Specialties.

TEACHING FACULTY — ATTENDING STAFF OF COOK COUNTY HOSPITAL

Address: Registrar, 427 S. Honore St., Chicago, Ill.

Afternoon Session—1:30 P.M.

Presidential Address: Some Intangibles in Medicine
A. E. Sohmer, M.D., Mankato

Case Reports:

Rhinolith
J. F. Schaefer, M.D., Owatonna

Desmoid Tumor
D. B. Judd, M.D., and J. C. Masson, M.D., Rochester

Pneumococcus Septicemia with Agranulocytosis
P. A. Lommen, M.D., Austin

The Clinical Use of Penicillin
Wallace E. Herrell, M.D., and D. R. Nichols, M.D., Rochester

The School Child's Hearing
Horace Newhart, M.D., Minneapolis

A Technique for the Easy Characterization of Abnormal Mental Traits
J. C. McKinley, M.D., and S. R. Hathaway, Ph.D., Minneapolis

The Mobile Unit of the Red Cross Blood Donor Center
Lt. E. H. Pawsat, M.C., U.S.N.R., and Lt. A. C. Peterson, M.C., U.S.N.R.

The Use of Blood and Plasma in General Practice
T. H. Seldon, M.D., Rochester

The Use of Plasma in Combat
Lt. Commander R. A. Benson, M.C., U.S.N.R.

Entertainment for the ladies will consist of a luncheon at the Austin Country Club followed by bridge or golf.

The luncheon and business meeting for members of the Association will be held at St. Augustine's High School. Both morning and afternoon sections of the scientific program will be held at Central High School.

Physicians are cordially invited to attend.

LEGAL MEDICINE CONFERENCE AND SEMINAR

Conference.—The Massachusetts Medico-Legal Society in conjunction with the Department of Legal Medicine of Harvard Medical School has arranged for an all-day Conference to be held at the Mallory Institute of Pathology, Boston City Hospital, on Wednesday, October 6, 1943. This will be open to any registered physician, lawyer, police official, criminal investigator, senior medical student or other person whose duties are associated with medico-legal topics.

It will include lectures, demonstrations, and informal discussions concerning many subjects in legal medicine, particularly stressing results of some more recent methods. No limit has been made for the number of conference attendants, there is no fee, and advance application is not essential. Advance notice of intention to attend would be helpful, however, and should be addressed to Dr. William H. Watters, Department of Legal Medicine, Harvard Medical School, Boston.

Seminar.—The Harvard Medical School, Courses for Graduates will offer a Seminar in Legal Medicine to occupy the entire week, October 4 to 9, inclusive. It is planned particularly for medical examiners and coroner's physicians, but will be open also to any other suitable graduate of an approved medical school.

The course will be practical rather than theoretical and will consist of autopsy demonstrations, technique and interpretation of laboratory tests, study of the day-by-day cases of a medical examiner, round table conferences, and the many subjects now included in the widening field of legal medicine. In order that each participant may receive the maximum benefit, the enrollment has been limited to fifteen. For the Seminar the fee is $25. Application should be made on or before October 1 to Harvard Medical School, Courses for Graduates, 25 Shattuck Street, Boston, Massachusetts.

Of General Interest

Dr. D. M. Thysell of Minneapolis has reported for service in the Navy.

* * *

Dr. Asher A. White of the Nicollet Clinic, Minneapolis, left for Knoxville, Tennessee, August 1, to join the special military unit there.

* * *

Dr. L. L. Kallestad of Hutchinson reported for military service as orthopedic surgeon with a special unit at Knoxville, Tennessee, July 15.

* * *

Captain A. I. Balmer, M.C., formerly of Pipestone, is now stationed in foreign service in Northwest Canada. He is at present Acting Regimental Surgeon of his unit.

* * *

Dr. L. H. Flancher of the State Department of Health, University of Minnesota, has accepted appointment as head of the department of health in Iowa, with headquarters in Des Moines.

* * *

Dr. and Mrs. F. J. Pelant moved in June from New Ulm to Owatonna, where Dr. Pelant has opened an office for the practice of medicine. Dr. Pelant had practiced in New Ulm since 1916.

Lt. Col. M. R. Johnson, M.C., AUS, of the Interstate Clinic, Red Wing, recently completed a course in maxillary facial surgery at Columbia University, New York. He is now located at Camp Crowder, Missouri.

* * *

Dr. John M. Waugh of Rochester addressed a meeting of the Upper Peninsula Medical Society at Iron Mountain, Michigan, Wednesday, July 7, on the subject "Indications for and Contra-indications to Vaginal Hysterectomy."

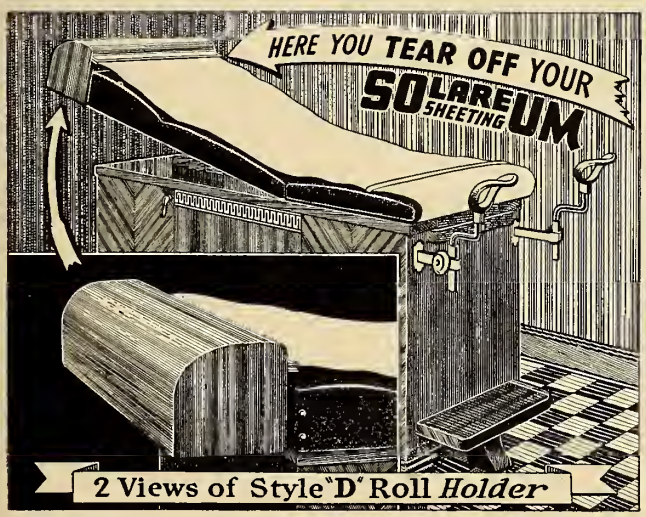
* * *

Dr. B. Borreson, medical director of the Oakland Park Sanatorium, Thief Rivers Falls, will supervise the work at Sunnyrest Sanatorium, Crookston, until such time as a successor to the late Dr. William Paradis is appointed.

* * *

Dr. Gerhard Knutson of Belview has joined the unit at Knoxville, Tennessee, for special military service, and has turned over his practice to his associates, Dr. Vernon Smith and Dr. Malcolm Pearson for the duration of the war.

SOLAREUM



(Above holder also supplied for metal tables)

PAPER TABLE SHEETING

Modern, Sanitary, Durable

An immaculate white paper especially made for the doctor's examining table makes no crackling noise, will not break or tear, is soft, clothlike, and comfortable.

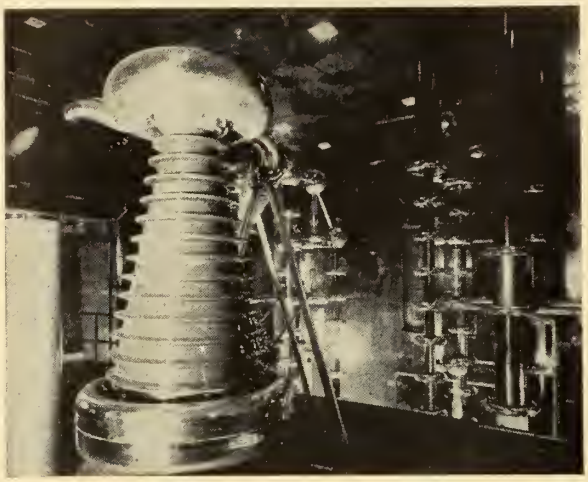
The convenient paper roll holder provides a continuous supply of SOLAREUM sheeting and adds a touch of sanitary efficiency to the physician's office.

Write for a fully illustrated, descriptive folder, or ask our salesman for details.

Brown & Bay, Inc.

ST. PAUL MINNESOTA

Radiation Therapy Institute



Upper End of Tube and Million Volt Generator

of Saint Paul

CHARLES T. MILLER HOSPITAL

Facilities for Radium and Roentgen Therapy, Including Million Volt Constant Potential Installation of Most Advanced Design.

You are cordially invited to visit the Radiation Therapy Institute and inspect its facilities

Edward Schons, M.D., *Director* J. P. Medelman, M.D., *Associate Director*

Dr. S. Marx White of Minneapolis has been reappointed a member of the Glen Lake Sanatorium commission for a three-year term by the Hennepin Board of County Commissioners. Those serving with Dr. White on the board are Lawrence Nygren and William F. Kunze, former mayor of Minneapolis.

* * *

Dr. John J. Stratte, a graduate of the Rush Medical School, University of Chicago, recently completed his internship at Ancker Hospital, Saint Paul, and opened an office for the practice of general medicine in Warren, Minnesota. Dr. J. J. Stratte, Sr. of Grand Forks, will assist his son in surgical work.

* * *

The Goodhue County Medical Society, under the supervision of Dr. Milton Levine of Cook County Hospital, Chicago, and Dr. David State of the University of Minnesota, established a 60-unit plasma bank at Red Wing, Minnesota, on July 11. The persons using the plasma will be charged a small processing fee and will be asked to provide donors to replace the bank.

* * *

Dr. William W. Moir, formerly of Stillwater, whose heroism as an army medical captain was described in a recent issue of *Look* magazine, has been promoted to Major. Major Moir won the distinguished service cross in North Africa when, disregarding his own safety, he continued attending wounded men, although twice wounded in the hand himself. Major Moir is at present stationed at Ft. Benning, Georgia.

Word has been received of the death of Dr. Volt Hung Tom, a graduate of the University of Minnesota Medical School in 1940. Doctor Tom was a battalion medical officer with the Army and before entering military service was a staff member of the Lansdale, Pennsylvania, Hospital. He died in the South Pacific about two months ago from malaria.

* * *

Dr. Harold A. Reif joined the staff of the Nicollet Clinic on August 1, 1943 in the Department of Urology, succeeding Dr. G. J. Thomas, who has left for California. Dr. Reif comes from Cleveland General Hospital and the Western Reserve University. While in Cleveland he was associated with Dr. H. R. Trattner, well-known urologist of that city. Previous to his being in Cleveland, he was associated with Dr. W. M. Coppridge, urologist, Duke University, Durham, North Carolina. Dr. Reif's position with the Western Reserve University was that of Demonstrator in Urology.

* * *

Dr. Earl V. Wetzel, Jr., former resident surgeon on the staff of St. Mary's Hospital, Minneapolis, and now an officer in the Medical Corps of the Army, has been advanced in rank from Captain to Major, according to a special announcement to MINNESOTA MEDICINE from headquarters of the Los Angeles Civilian Schools Area, Army Air Forces Technical Training Command.

Major Wetzel holds the post of Area Surgeon, exercising supervision over all medical activities of the A.A.F. Technical Training Command in California. The Area is one of the largest regional operations of the

Technical Training Command, the Minnesotan being in charge of medical service and personnel of eighteen detachments throughout the state.

Major Wetzel is a graduate of the University of Minnesota Medical School. Commissioned as a first lieutenant in November, 1941, he has won rapid advancement to his present rank.

* * *

News of the University of Minnesota Medical School contains the following items of interest:

A new annual appropriation of $15,000 has been made by the State Legislature to the Medical School for special research in the field of cancer.

A continuation of the grant of $10,000 a year has been authorized by the Citizens Aid Society to the Medical School in support of cancer research and the program of cancer education. The annual gift of $5,500 by the Citizens Aid Society in support of the George Chase Christian Professorship in Cancer Research will also be continued.

A grant of $5,000 from the Jane Coffin Childs Memorial Fund for Medical Research has been made for the support of the work of Dr. John J. Bittner and Dr. Robert G. Green and associates in the Departments of Physiology and Bacteriology on the nature and mode of action of the milk influence in mammary cancer.

A grant of $3,500 a year for a two-year period has been made by The Commonwealth Fund of New York toward the support of the Psychiatric Clinic for Children. Toward the support of this Clinic the Stevens Avenue Home of Minneapolis will continue their grant of $10,000 for the year beginning July 1, 1943.

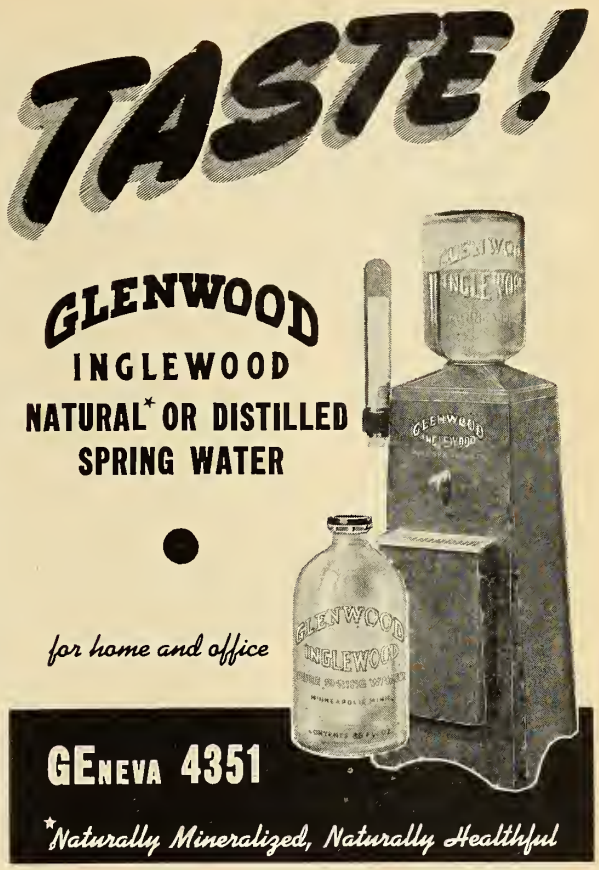
The University of Minnesota Medical School has accepted a grant of $3,000 from Parke, Davis and Company, to establish a Fellowship in Clinical Hematology in the Department of Anatomy, under the supervision of Dr. Hal Downey.

Dr. J. C. McKinley, Head of the Department of Medicine and Director of the Division of Nervous and Mental Diseases, has been named Head of the newly established Department of Neuropsychiatry, which includes the Divisions of Adult Psychiatry and Child Psychiatry.

Dr. Cecil J. Watson has been named Head of the Department of Medicine and Director of the Division of Internal Medicine.

Dr. Raymond N. Bieter, Professor of Pharmacology, has been appointed to the Headship of the Department of Pharmacology to succeed the late Dr. Arthur D. Hirschfelder.

The following promotions have been announced: Dr. Harold A. Whittaker, to Clinical Professor of Preventive Medicine and Public Health; Dr. Ralph T. Knight, to Clinical Professor of Anesthesia; Dr. Wallace D. Armstrong, to Professor of Physiological Chemistry. The promotions of Dr. Clarence Dennis, to Associate Professor of Surgery; Dr. N. Logan Leven, to Clinical Associate Professor of Surgery; Dr. Charles E. McLennan, to Associate Professor of Obstetrics and Gynecology; Dr. Charles E. Connor, to Clinical Associate Professor of Ophthalmology and Otolaryngology;



86c out of each $1.00 gross income used for members' benefit

PHYSICIANS CASUALTY ASSOCIATION
PHYSICIANS HEALTH ASSOCIATION

ACCIDENT HOSPITAL SICKNESS
INSURANCE

For Ethical Practitioners Exclusively

[57,000 Policies in Force]

$5,000.00 accidental death $25.00 weekly indemnity, accident and sickness	For **$32.00** per year
$10,000.00 accidental death $50.00 weekly, indemnity, accident and sickness	For **$64.00** per year
$15,000.00 accidental death $75.00 weekly indemnity, accident and sickness	For **$96.00** per year

ALSO HOSPITAL EXPENSE FOR MEMBERS, WIVES AND CHILDREN

41 years under the same management

$2,418,000.00 INVESTED ASSETS

$11,350,000.00 PAID FOR CLAIMS

$200,000 deposited with State of Nebraska for protection of our members.

Disability need not be incurred in line of duty—benefits from the beginning day of disability.

Send for applications, Doctor, to

400 First National Bank Bldg. Omaha, Nebr.



Dr. Joseph T. Cohen, to Clinical Associate Professor of Pediatrics; Miss Ruth B. Freeman, to Associate Professor of Preventive Medicine and Public Health; Mr. George O. Pierce, to Associate Professor of Preventive Medicine and Public Health; Dr. Edward A. Regnier, to Clinical Associate Professor of Surgery; Dr. Thomas J. Kinsella, to Clinical Associate Professor of Surgery; Dr. Frank W. Whitmore, to Clinical Associate Professor of Neuropsychiatry. The promotions of Dr. Frederick W. Hoffbauer, to Assistant Professor of Medicine; Dr. Thomas Lowry, to Clinical Assistant Professor of Medicine; Dr. Alphonse Walch, to Clinical Assistant Professor of Medicine; Dr. James K. Anderson, to Clinical Assistant Professor of Surgery; Dr. Willard D. White, to Clinical Assistant Professor of Surgery; Dr. Hewitt B. Hannah, to Clinical Assistant Professor of Neuropsychiatry.

Word has been received that General Hospital No. 26, the University of Minnesota hospital unit, was established near the Tunisian front. With its staff of fifty-six doctors, 105 nurses and 500 enlisted men and some 600 tons of equipment which included tents, beds and apparatus, it was established just in time to take a load of 1,500 patients sent back from the evacuation and base hospitals in the final stages of the Tunisian fighting. Consisting for the most part of tents and with little furnishings generally considered essential for a general hospital, much equipment had to be improvised from what was at hand. A high-pressure gasoline system of hot water heating was improvised from empty gas drums. In spite of handicaps, the hospital was prepared to handle efficiently the many casualties who required not emergency care but the type of care furnished by any large general hospital. It is reported that General Hospital No. 26 is one of the few stations in the Army where saluting is rigidly required of nurses.

CLASSIFIED ADVERTISING

WANTED—Information concerning opportunities for establishing medical practice in Minneapolis. Address D-54, care MINNESOTA MEDICINE.

* * *

WANTED—Physician part time industrial position in Saint Paul area. Address D-55, care MINNESOTA MEDICINE.

* * *

DOCTOR with number of years' experience in general practice wishes to assist surgeon F.A.C.S. Desirous of surgical experience. Address D-57 care MINNESOTA MEDICINE.

FOR SALE—Victor Snook x-ray and fluoroscope, tilt table, developing tanks. Good condition. $550.00 cash. Basal metabolism machine, sterile water tanks, pressure sterilizer, instrument sterilizers, gauze, cotton, cellucotton, five gallons lysol, sutures, various splints, delivery bed, fracture beds, ether and chloroform. Address Dr. Henry C. Cooney, Princeton, Minnesota.

* * *

WANTED—An associate general practitioner, draft exempt. Iowa town of 9,000. Salary $500 a month. Address D-56, care MINNESOTA MEDICINE.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

MEDICAL MALPRACTICE. Louis J. Regan, M.D., LL.B., Member State Bar of California. 256 pages. Price, $5.00, cloth. St. Louis: C. V. Mosby Co., 1943.

METHODS OF TREATMENT. Eighth Edition. Logan Clendening, M.D., Clinical Professor of Medicine, Medical Department of University of Kansas, Attending Physician University of Kansas Hospitals; and Edward H. Hashinger, A.B., M.D., Clinical Professor of Medicine, Medical Department of University of Kansas, Attending Physician, University of Kansas Hospital, Attending Physician St. Luke's Hospital, Kansas City, Missouri. 1033 pages. Illus. Price, $10.00, cloth. St. Louis: C. V. Mosby Co., 1943.

A SYNOPSIS OF CLINICAL SYPHILIS. James Kirby Howles, B.S., M.D., M.M.S. Professor of Dermatology and Syphilology and Director of the Department Louisiana State University School of Medicine, Senior Visiting Physician Charity Hospital of Louisiana at New Orleans, Visiting Physician French Hospital, Mercy Hospital, Hotel Dieu, Southern Baptist Hospital and Touro Infirmary. 671 pages. Illus. Price, $6.00, flexible binding. St. Louis: C. V. Mosby Co., 1943.

YOUR OWN STORY. Marion L. Faegre, Assistant Professor of Parent Education, Institute of Child Welfare, University of Minnesota, and Special Consultant to the Minnesota Department of Health. 52 pages. Illus. Paper binding. Minneapolis: Minnesota Department of Health, 1943.

CONVULSIVE SEIZURES: HOW TO DEAL WITH THEM. A Manual for Patients, Their Families and Friends. Tracy J. Putnam. Price $2.00. Pp. 168. Philadelphia: J. B. Lippincott Company, 1943.

This book, written by a world-famous authority, is evidence of a healthy trend in the present-day medical education of the lay public. It is a little book written primarily for the sake of the patient and his family—and as such, will bring understanding and new hope to those thousands to whom the word "epilepsy" holds bewilderment, terror and even disgrace.

The book is divided into nine short chapters. Chapter 1 deals in general with seizures and their causes. The author presents briefly and clearly the various types of seizures and the common causes. This chapter, as well as the entire text, is written in non-technical terms and easily understandable language. Dr. Putnam's figurative representation of seizures and the situations which produce them is especially valuable—and clear.

Chapter 2 is devoted to the diagnosis and cause of seizures. He stresses the need for diagnostic study and briefly discusses the special techniques employed. The physician will find he is already familiar with this as well as most other parts of the text—but to the patient, the importance of such diagnostic procedures is adequately pointed out. Doctor Putnam also points out that the patient's own physician can manage the situation alone and that a specialist is not essential unless some unusual problem arises or treatment fails to go smoothly. In the reviewer's opinion this point is well taken, and will help to clear up a misconception present in the minds of many.

Chapter 3 tells of the important part the patient and his family play and suggests ways and means of reporting symptoms, keeping charts or records of seizures—the type, frequency, et cetera. The author also



VOCATIONAL HOSPITAL

. . . An integral part of the Miller Vocational High School offers two special features—Patients receive a maximum of personal attention from student practical nurses—All food is prepared under the direction of a qualified dietitian. Patients remain under the care of their own physicians.

Director of Nurses—M. H. WOLTMAN, R.N., B.S.
Superintendent & Dietitian—H. B. BROWN, B.S.

Physicians may secure services of Vocational nurses by calling Nurses Headquarters and asking for a Vocational Nurse

Bridgeport 2281

5511 South Lyndale - - Minneapolis

DANIELSON MEDICAL ARTS PHARMACY, INC.

PHONES:
ATLANTIC 3317
ATLANTIC 3318

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

HOURS:
WEEK DAYS—8 to 7
SUN. AND HOL.—10 TO 1

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.
414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.
INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS
MAIN 2494



REST HOSPITAL

A quiet, ethical hospital with therapeutic facilities for the diagnosis, care and treatment of Nervous and Medical cases. Invites coöperation of all reputable physicians who may supervise the treatment of their patients.

PSYCHIATRISTS IN CHARGE
Dr. Hewitt B. Hannah
Dr. Joel C. Hultkrans

2527 2nd Ave. S., Minneapolis, Phone At. 7369



The Birches Sanitarium, Inc.

2391 Woodland Avenue

Duluth, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Psychiatrists in Charge

L. R. Gowan, M.D. **A. S. Nissen, M.D.**

emphasizes the importance of regularity in taking medications and adhering to strict schedules.

Chapter 4 deals with the actual handling of the patient during a seizure and emphasizes the importance of reporting symptoms, type of convulsion, records, et cetera, to the physician.

Chapter 5, while not containing any information new to the physician, briefly outlines the various forms of treatment and types of medication. Contained in this chapter is a concise outline of general precautions to be taken by those suffering from seizures. In the reviewer's opinion, this particular part is presented too briefly and the value of the book would be increased if more precautions were added.

Chapters 6 and 7 deal with the general outlook not only for the individual afflicted but for control of the disorders, and will serve adequately in answering many of the questions that naturally plague the patient and his family.

The final two chapters are of less importance to the patient and the book would be just as valuable if they were omitted.

Doctor Putnam definitely states in his introduction that the book is not intended for professional use. It is the belief of the reviewer, however, that he is too conservative in his estimation of its value. The book is an excellent one and contains an immense amount of accurate and valuable information, adequately condensed and outlined, for the physician, the student, and teacher of epileptic pupils, as well as for the patient and his relatives. In my opinion, the book is to be highly recommended.

PHILIP K. ARZT, M.D.

REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY. Issued under the direction and supervision of the Council on Pharmacy and Chemistry of the American Medical Association. Cloth. Price, $1.00. Pp. 207. Chicago: American Medical Association, 1943.

Through the years the size of this volume has grown with the increased work of the Council on Pharmacy and Chemistry until the present edition has the same number of pages as the book published in 1908, which covered the Council's first four years of activity. Some of the functions of this group are well known, but a more thorough understanding of the Council's scope may be gained from the annual reprint. This volume epitomizes that phase of the Council's work which may be said to be collateral to the "acceptance" of drugs—the informative consideration of current medical problems in the interest of rational therapeutics. It contains reports of studies by private investigators which were originally published in *The Journal* under the sponsorship of the Council such as preliminary discussions of new developments in therapeutics and timely articles on the status of recognized agents as well as reports of omission or rejection of products from New and Nonofficial Remedies. It also offers a record of current decisions on matters of Council policy.

Several of the reports are of particular interest for various branches of medical science: the use of bulk ether in anesthesia, the absorption of surgical gut (catgut), the higher types of antipneumococcus rabbit serum, the surgical and medical treatment of animals with experimental hypertension and the status of racemic epinephrine solutions for oral administration. The reports in this small compact volume represent expert medical consensus and are proffered to aid in the consideration of the value of therapeutic agents.

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.

414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.

INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS

MAIN 2494

SAVE TIME!

TRY DAHL'S FIRST

Biologicals
Pharmaceuticals
Hypodermic Medications
Dressings
Surgical Instruments
Trusses

7:30 a.m. to 11 p.m.
Holidays, 9 a.m. to 11 p.m.

Joseph E. Dahl Co.

Incorporated

ATlantic 5445 — 82 So. 9th St., Mpls.

Radiological and Clinical

Assistance to Physicians
in this territory

MURPHY LABORATORIES

Minneapolis: 612 Wesley Temple Bldg. - - At. 4786
St. Paul: 348 Hamm Bldg. - - - - - - - Ce. 7125
If no answer, call - - - - - - - - - - Ne. 1291



Orthopedic Braces and Appliances

Physicians' specifications followed precisely.
Scientific manufacture and fitting.

AUGUST F. KROLL

Manufacturer
230 WEST KELLOGG BLVD.
St. Paul, Minn. — CE. 5330

Hall & Anderson

PRESCRIPTION PHARMACY
BIOLOGICALS
PHYSICIANS' SUPPLIES

SAINT PAUL, MINN.

LOWRY MEDICAL ARTS BUILDING
TELEPHONE: CEDAR 2735

CHECKING SERVICE . . .

The American ECONOMY *Way*

THE AMERICAN NATIONAL BANK offers a NEW PLAN in Personal Checking Accounts.

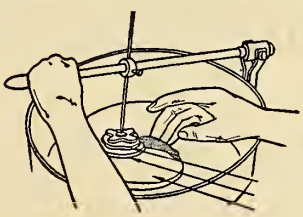
This service is offered to those who would like to open a checking account but find it inconvenient to maintain the balance required for regular checking accounts. A charge of 7c is made for each check paid, also a nominal charge on deposits.

Open an account for any amount.

THE AMERICAN NATIONAL BANK

BREMER ARCADE — 7TH AT ROBERT
Free Parking — *Member Federal Deposit Insurance Corporation*
Cedar 0573

UNUSUAL LENS GRINDING



CATARACT, MYO-THIN and other difficult and complicated lenses are ground to extreme thinness and accuracy by our expert workmen.

ARTHUR F. WILLIAMS

SAINT PAUL
MINNESOTA

Save 25 to 40 Per Cent

Druggists' Mutual Insurance Company

OF IOWA, ALGONA, IOWA

Fire - Tornado - Automobile Insurance

Prompt Loss Service

Minneapolis Branch—S. E. STRUBLE, 835 Palace Bldg.

Home Office—Algona, Iowa



Three of the units

Glenwood Hills Hospitals

3501 Golden Valley Road
Hyland Station
Route Seven

Operated In Connection with Homewood Hospital

Plymouth at Penn Avenue, Minneapolis

FOR THE TREATMENT OF NON-SURGICAL AND NON-INFECTIOUS DISEASES

A modern hospital built on the cottage plan. The buildings are located on elevated land, affording beautiful views on all sides. Glenwood Hills Hospitals have all the advantages of rural surroundings, and are still only a few minutes by automobile from the Minneapolis loop.

AN INVITATION

The facilities of these institutions are available for all reputable members of the medical profession.



HOMEWOOD HOSPITAL is one of the Northwest's outstanding hospitals for the treatment of Nervous Disorders—equipped with all the essentials for rendering high grade service to patient and physician.

Operated in Connection with Glenwood Hills Hospitals

HOMEWOOD HOSPITAL

Corner Penn and Plymouth Avenues North
Minneapolis Minnesota

Social and Educational Adjustment

for exceptional children of all ages. Visit the school noted for its work in educational development and fitting such children for more normal living. Beautiful grounds. Home atmosphere. Separate buildings for boys and girls.

Catalog by request.

The MARY E. POGUE SCHOOL

124 GENEVA ROAD WHEATON, ILL.
(NEAR CHICAGO)

Send us your slow collection items.

All accounts made by personal calls.

We specialize in Medical and Dental Accounts.

Bonded and Licensed Under Minnesota State Laws

Northwestern Adjustment Co.

518 Bremer Arcade Bldg.
St. Paul Minnesota

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 **September, 1943** **No. 9**

Contents

THE DIFFERENTIATION OF ENDOMETRIOSIS AND CARCINOMA OF THE SIGMOID COLON.
E. L. Jenkinson, M.D., and *W. H. Brown, M.D.,* Chicago, Illinois 773

PRACTICAL APPLICATIONS OF A ROUTINE BLOOD COUNT IN THE NEWBORN.
Frank C. Neff, M.D., Kansas City, Kansas..... 779

TRANSURETHRAL RESECTION.
Arthur N. Collins, M.D., Duluth, Minnesota..... 782

DAMAGE TO THE SPINAL CORD AND MENINGES FOLLOWING SPINAL ANESTHESIA—A CLINICO-PATHOLOGICAL STUDY.
Gordon R. Kamman, M.D., F.A.C.P., Saint Paul, Minnesota, and *A. B. Baker, M.D., Ph.D.,* Minneapolis, Minnesota 786

MINNESOTA SOLDIERS DISCHARGED FOR MENTAL DISABILITY.
Royal C. Gray, M.D., Ph.D., Minneapolis, Minnesota 791

THE INFLUENCE OF WAR ON MEDICINE.
Bowman C. Crowell, M.D., Chicago, Illinois.... 795

THIAMIN CHLORIDE—AN AID IN THE SOLUTION OF THE MOSQUITO PROBLEM.
W. Ray Shannon, M.D., Saint Paul, Minnesota.. 799

CLINICAL-PATHOLOGICAL CONFERENCE.
Presentation of a Case.
A. J. Hertzog, M.D., and *S. V. Lofsness, M.D.,* Minneapolis, Minnesota 803

HISTORY OF MEDICINE IN MINNESOTA.
History of Medicine in Dodge County (Continued).
James Eckman, Rochester, and *Charles E. Bigelow, M.D.,* Dodge Center, Minnesota.... 805

PRESIDENT'S LETTER 811

EDITORIAL:
Congress and Socialism..... 812
U. S. Cadet Nurses Corps..... 812
Sulfonamide Sensitivity 813
Spontaneous Pneumothorax 813
The Minnesota Public Health Association..... 814

MEDICAL ECONOMICS:
Congressmen Listen to Professions Back Home.. 816
Industrial Survey 817

THE MINNESOTA PUBLIC HEALTH ASSOCIATION.
E. A. Meyerding, M.D., Saint Paul, Minnesota.. 818

MINNESOTA STATE MEDICAL ASSOCIATION—Proceedings Ninetieth Annual Session..... 819

MINNEAPOLIS SURGICAL SOCIETY:
Meeting of April 1, 1943..... 833

Aseptic Gastric Resection for Ulcer and Carcinoma.
L. C. Culligan, M.D., F.A.C.S., Minneapolis.. 833

Rupture of the Long Head of the Biceps Brachii.
R. C. Webb, M.D., Minneapolis..... 834

Rupture of the Long Head of the Biceps Muscle of the Arm.
O. W. Yoerg, M.D., F.A.C.S., Minneapolis.... 836

IN MEMORIAM 838

OF GENERAL INTEREST 842

Contents of MINNESOTA MEDICINE copyrighted by Minnesota State Medical Association, 1943

Entered at the Post Office in Minneapolis as second class mail matter. Accepted for mailing at the special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 13, 1918.

MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL ASSOCIATION

Published by the Association under the direction of its Editing and Publishing Committee

EDITING AND PUBLISHING COMMITTEE

E. M. HAMMES, Saint Paul
PHILIP F. DONOHUE, Saint Paul
H. W. MEYERDING, Rochester
H. A. ROUST, Montevideo
B. O. MORK, JR., Worthington
A. H. WELLS, Duluth
O. W. ROWE, Duluth
T. A. PEPPARD, Minneapolis
HENRY L. ULRICH, Minneapolis
C. L. OPPEGAARD, Crookston

EDITORIAL STAFF

CARL B. DRAKE, Saint Paul, Editor
GEORGE EARL, Saint Paul, Associate Editor
HENRY L. ULRICH, Minneapolis, Associate Editor

BUSINESS MANAGER

J. R. BRUCE

Annual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian Subscriptions—$3.50.

The right is reserved to reject material submitted for editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

Classified advertising—five cents a word; minimum charge, $1.00. Remittance should accompany order.

Display advertising rates on request.

Address all communications to Minnesota Medicine, 2642 University Avenue, Saint Paul, or National Bldg., Minneapolis. Telephone Nestor 2641.

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN



MAIN BUILDING—ONE OF THE 5 UNITS IN "COTTAGE PLAN"

A Modern Private Sanitarium for the Diagnosis, Care and Treatment of Nervous, Mental and Medical Cases

Located on beautiful Lake St. Croix, eighteen miles from the Twin Cities, it has the advantages of both City and Country. Every facility for treatment provided, including recreational activities and occupational-therapy under trained personnel. Milk, cream and butter from our own herd of Tuberculin-tested Registered Guernsey Cows. Inspection and coöperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

CONSULTING NEURO-PSYCHIATRISTS

RESIDENT PHYSICIAN
Howard J. Laney, M.D.
Prescott, Wisconsin
Tel. 39

Hewitt B. Hannah, M.D.
Joel C. Hultkrans, M.D.
511 Medical Arts Building
Minneapolis, Minnesota
Tel. MAin 4672

SUPERINTENDENT
Ella M. Mackie
Prescott, Wisconsin
Tel. 69



Even on repeated application

this powerful vasoconstrictor provides fast, sustained nasal decongestion without appreciable cardiac or psychic reaction

Neo-Synephrine

Hydrochloride

(laevo—alpha—hydroxy—beta—methyl—amino—3 hydroxy ethylbenzene hydrochloride)



ACCEPTED AMERICAN MEDICAL ASSN Council on Pharmacy and Chemistry

Available in a ¼% or 1% solution in 1-oz. bottles for dropper or spray; and as a ½% jelly in collapsible tube with applicator.

Frederick Stearns & Company

Since 1855 . . ESSENTIALS OF THE PHYSICIAN'S ARMAMENTARIUM

NEW YORK KANSAS CITY SAN FRANCISCO **DETROIT, MICH.** WINDSOR, ONTARIO SYDNEY, AUSTRALIA AUCKLAND, NEW ZEALAND

Warrior

THE military doctor of World War II — unarmed yet unafraid — moves up shoulder to shoulder with the combat troops. Bayonet charge . . . parachute landing . . . beach-storming from raiding barges . . . constantly, the medical officer proves that he is every inch a fighting man.

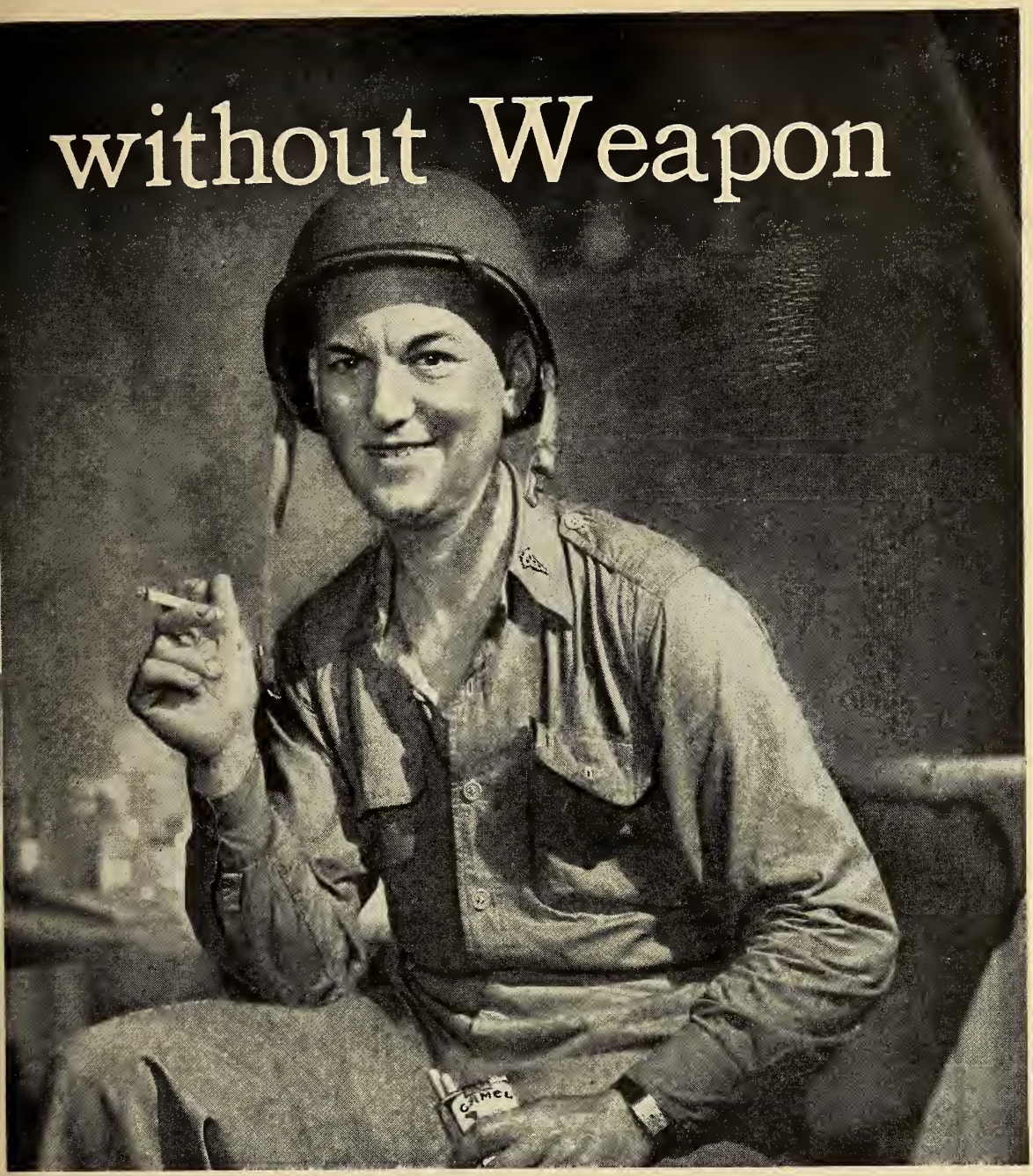
More than likely, he's a Camel smoker, too, for Camel's mellow mildness and smooth, comforting flavor quickly won it first choice in the armed forces.*

Planning a gift for someone in service? Make it Camels . . . a carton . . . the *thoughtful* remembrance.



BUY WAR BONDS STAMPS

Camel

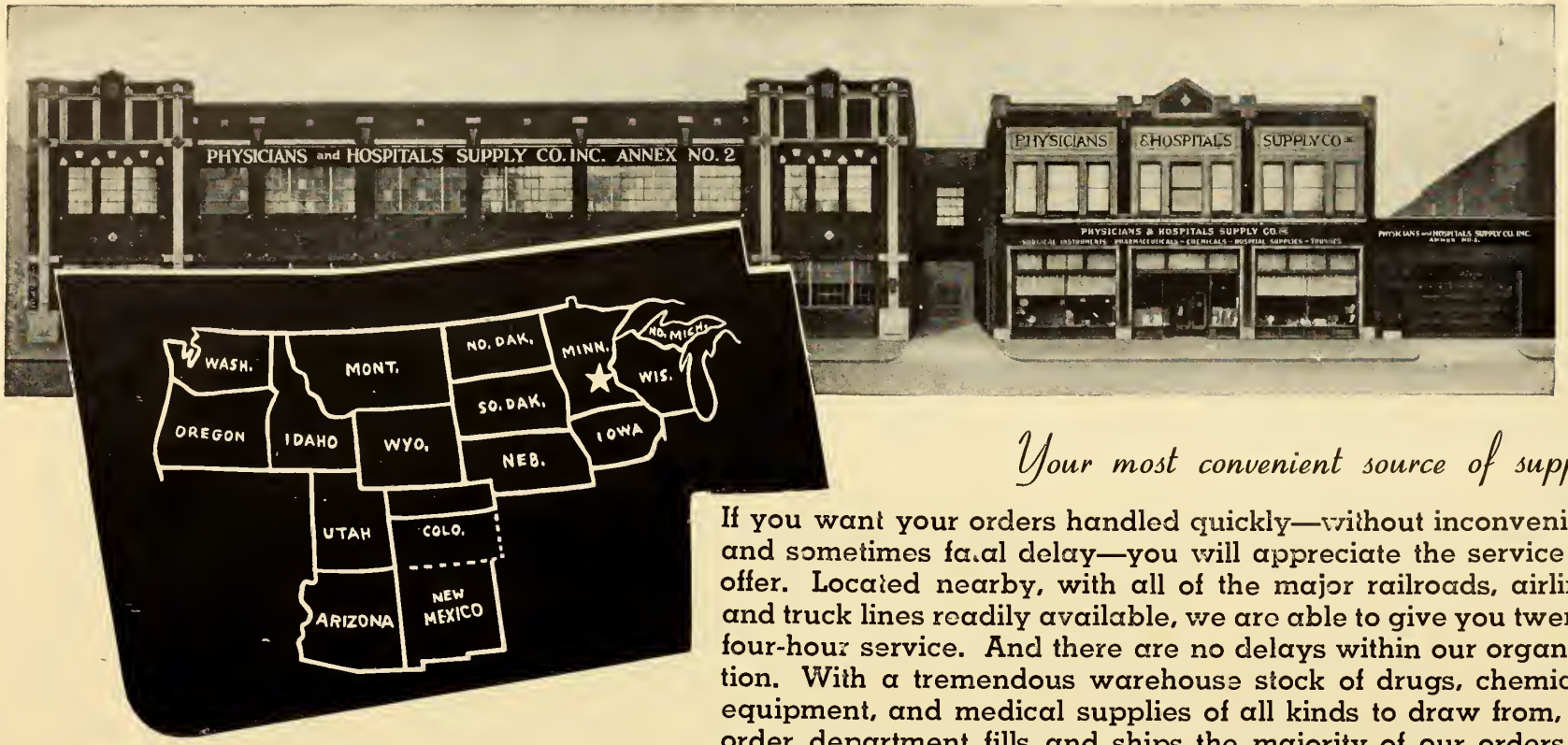


1st in the Service

*With men in the Army, the Navy, the Marine Corps, and the Coast Guard, the favorite cigarette is Camel. (Based on actual sales records.)

New reprints available on cigarette research—Archives of Otolaryngology, February, 1943, pp. 169-173—March, 1943, pp. 404-410. Camel Cigarettes, Medical Relations Division, One Pershing Square, New York 17, N. Y.

Costlier Tobaccos



Your most convenient source of supply

If you want your orders handled quickly—without inconvenient, and sometimes fatal delay—you will appreciate the service we offer. Located nearby, with all of the major railroads, airlines, and truck lines readily available, we are able to give you twenty-four-hour service. And there are no delays within our organization. With a tremendous warehouse stock of drugs, chemicals, equipment, and medical supplies of all kinds to draw from, our order department fills and ships the majority of our orders the same day they are received. You will enjoy our friendly, accurate service equally as much as we will enjoy serving you. If you are not already familiar with P & H service get acquainted now. Write, wire, or phone your order today; we are at your service day or night.

PHYSICIANS and HOSPITALS SUPPLY CO. Inc.
MINNEAPOLIS, MINNESOTA

Rapid and pronounced reduction of stomach acidity

Creamalin promptly reduces stomach acidity. Moreover, the antacid effect is sustained.

With Creamalin there is no compensatory reaction by the gastric mucosa and no oversecretion of hydrochloric acid. Furthermore, there is no risk of producing alkalosis.

When employed with an ulcer regimen, Creamalin often induces unusually rapid healing of peptic ulcer.

Supplied in 8 oz., 12 oz. and 1 pint bottles



ACCEPTED
AMERICAN MEDICAL ASSN.
Council on Pharmacy and Chemistry

CREAMALIN

Reg. U. S. Pat. Off.

ALUMINUM HYDROXIDE GEL

Non-Alkaline Antacid Therapy

WINTHROP CHEMICAL COMPANY, INC.

Pharmaceuticals of merit for the physician

NEW YORK, N. Y. **WINDSOR, ONT.**

More than 400 Minnesota Physicians have secured their

Special Policy for All Eligible Members of Minnesota State Medical Association



Which Includes

Disability life annuity non-pro-rating

NON-CANCELLABLE and GUARANTEED RENEWABLE FEATURES
No Terminating Age
Lifetime Policy with Lifetime Benefits
—from the First Day Available to You as Members

- Pays benefits from FIRST DAY to LIFE for accidents and from FIRST DAY to LIFE for sickness.
- Carries full waiver of premium clause.
- Policy pays regardless of whether disability is immediate.
- Policy does not terminate at any age.
- Monthly benefits, $200.00; double indemnity, $400.00.
- Accident death benefits, $5,000.00; double indemnity, $10,000.00.
- Mutual Benefit is licensed in every state in the U.S.A.
- Additional benefits, $100.00 per month while in hospital.
- Additional benefits, $100.00 per month for nurses care at home.

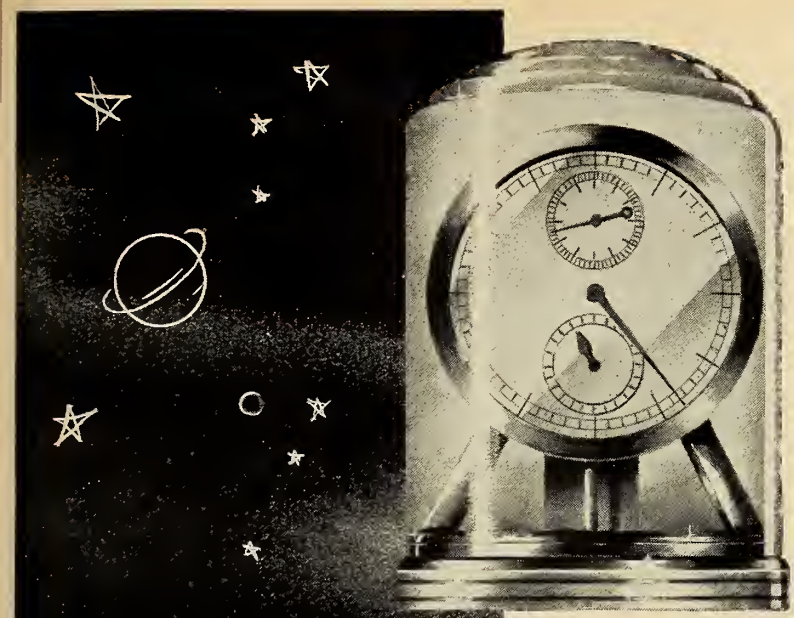
Note:

To the Doctors who request information, regardless of your location in the state, our registrars will contact you before the registration is closed for the Minnesota group. Our staff of registrars is small—transportation facilities limited—We can probably make but one call—We suggest that you write immediately.

Minnesota Claim Office
410 McKnight Bldg.
Minneapolis, Minnesota

MUTUAL BENEFIT HEALTH AND ACCIDENT ASSOCIATION
OMAHA

Address:
Professional Group Department
410 McKnight Bldg.
Minneapolis, Minnesota



Consistent Performance

★ Unchanging, the Naval Observatory clock at Arlington has ticked on for decades. Its unvarying time is the accepted standard throughout the nation. The same consistent performance may be expected from PITOCIN*. Rigid standardization and marked stability assure the same reaction today as yesterday and the day before.

★ PITOCIN'S potent oxytocic principle, negligible amount of pressor factor, low protein content and freedom from impurities assures stimulation of uterine contracture, no appreciable rise in blood pressure and a minimum possibility of reactions—true uniformity.

★ Chief indications for PITOCIN (alpha-hypophamine) are: medical induction of labor; stimulation of uterus, in properly selected cases, during labor; prevention of postpartum hemorrhage and bleeding following curettage; and treatment of postpartum and late puerperal hemorrhage.

*TRADE-MARK REG. U. S. PAT. OFF.

PITOCIN

A product of modern research offered to the medical profession by Parke, Davis & Company

PARKE, DAVIS & COMPANY

DETROIT, MICHIGAN

"don't smoke"...

is advice hard for patients to swallow. May we suggest, instead, *SMOKE "PHILIP MORRIS"?*
Tests showed 3 out of every 4 cases of smokers' cough cleared on changing to PHILIP MORRIS. Why not observe the results for yourself?

OPTIMUM NUTRITION FOR BABY...

MINIMUM TIME FOR DOCTOR...



with this complete liquid infant formula!

BIOLAC SUPPLIES milk proteins, milk minerals, iron, and vitamins A, B_1, B_2 and D in amounts which equal or exceed recognized requirements for infants. Thus with the sole exception of vitamin C, Biolac provides *complete* nutrition for the bottle-fed baby.

Biolac is a real timesaver for overworked doctors, too! *No carbohydrate or other extra formula ingredients to calculate!*

Also, with Biolac there is less chance of upsets due to errors in preparing formulas. Less chance of formula contamination, too, because Biolac requires only simple dilution with boiled water, as you prescribe.

NO LACK IN BIOLAC

Borden's complete infant formula

● *Biolac is prepared from whole milk, skim milk, carbohydrates—Vitamin B_1, concentrate of Vitamins A and D from cod liver oil, and ferric citrate. It is evaporated, homogenized, and sterilized. For professional information, write Borden's Prescription Products Division, 350 Madison Avenue, New York, New York.*

PYOKTANIN SURGICAL GUT

Plain and Formalized

Manufactured Since 1899 by

The Laboratory of the Ramsey County Medical Society

Packaged dry in hermetically sealed glass tubes in accordance with the new requirements of the U. S. Pharmacopoeia.

• • •

Price List

PLAIN TYPE A NONBOILABLE
AND
FORMALIZED TYPE C NONBOILABLE

Sizes.....000 — 00 — 0 — 1 — 2 — 3
28 inches.....per dozen strands $2.00
60 inches.....per dozen strands $3.00

Special discount to hospitals and to the trade. Cash must accompany the order.

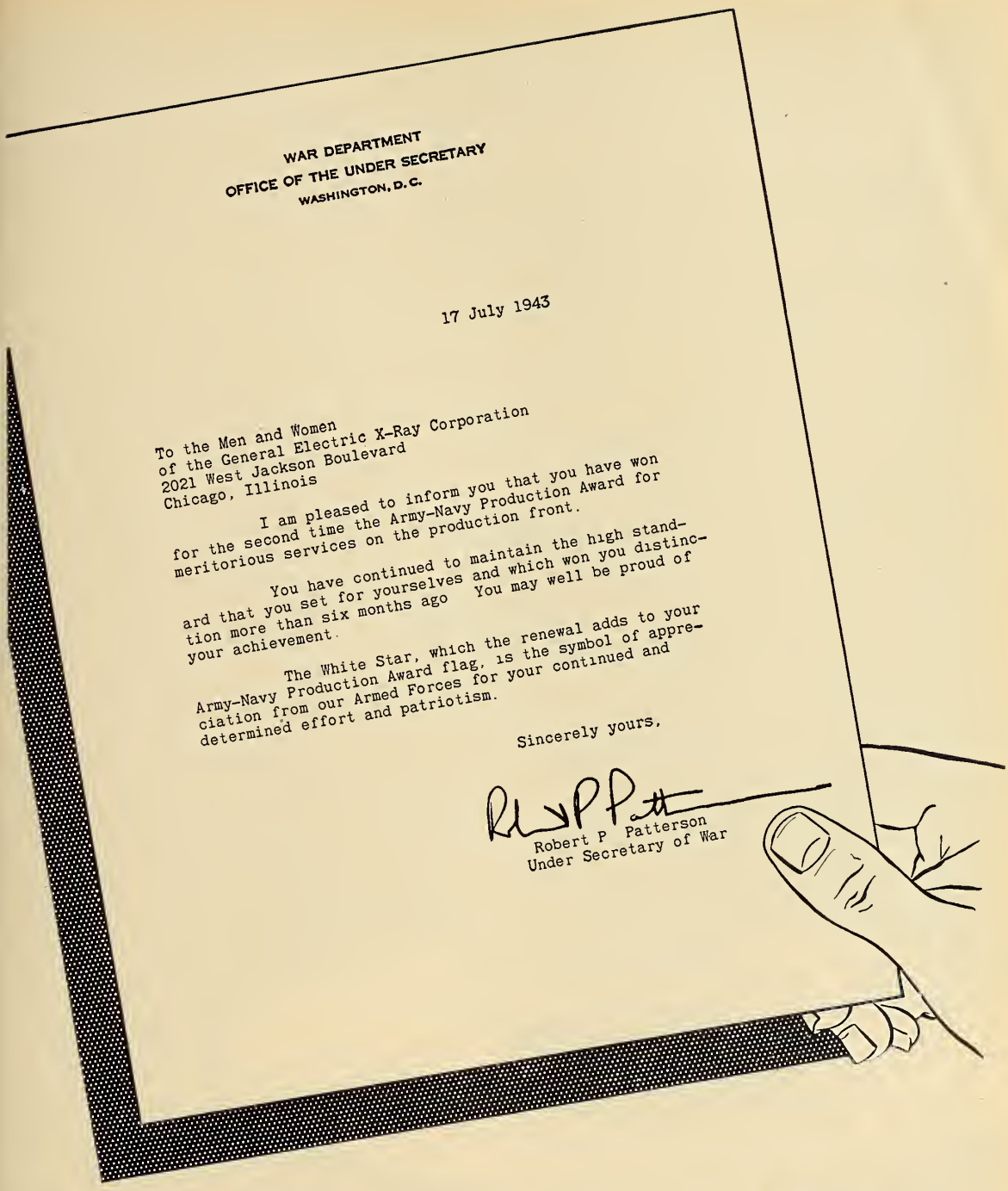
• • •

Address

LABORATORY RAMSEY COUNTY MEDICAL SOCIETY

Lowry Medical Arts Building, St. Paul, Minnesota

FOR SALE BY SURGICAL DEALERS AND DRUGGISTS



WAR DEPARTMENT
OFFICE OF THE UNDER SECRETARY
WASHINGTON, D.C.

17 July 1943

To the Men and Women
of the General Electric X-Ray Corporation
2021 West Jackson Boulevard
Chicago, Illinois

I am pleased to inform you that you have won for the second time the Army-Navy Production Award for meritorious services on the production front.

You have continued to maintain the high standard that you set for yourselves and which won you distinction more than six months ago. You may well be proud of your achievement.

The White Star, which the renewal adds to your Army-Navy Production Award flag, is the symbol of appreciation from our Armed Forces for your continued and determined effort and patriotism.

Sincerely yours,

Robert P Patterson
Under Secretary of War

G-E STANDARDS ARE SET UP TO BE MAINTAINED — IN WAR AND IN PEACE

ARMY E NAVY

GENERAL ELECTRIC
X-RAY CORPORATION
3012 JACKSON BLVD CHICAGO (12), ILL., U. S. A.

Today's Best Buy — U. S. War Bonds

"SYMBOL OF QUALITY
IN THE FIELD OF
NUTRITION"



INFANT NUTRITION

• BIOCHEMICALS FOR
DEFICIENCY DISEASES

S. M. A. CORPORATION • 8100 McCORMICK BLVD • CHICAGO, ILL.

THE PHYSICIAN ALONE



Early sign of Vitamin A Deficiency: slight thickening of conjunctiva at equator; slight increase of vascularity; swelling of caruncle and plica semilunaris.

IS QUALIFIED



Early Indication of B Complex Deficiency Shown in Marginal "Fluting" of Tongue with Redness or Soreness of Tip.

TO INTERPRET



Early Manifestation of Ariboflavinosis is Found in Pallor and Maceration of Lips at Angles of Mouth.

AND PRESCRIBE

Early recognition of the signs of deficiency states and appropriate therapy, prevent the development of more serious conditions that frequently require prolonged medication.

The physician, and he alone, is qualified to diagnose accurately and to prescribe for early as well as advanced vitamin inadequacies.

For this reason White's have consistently adhered to a policy of ethical promotion, in which no form of consumer advertising is ever employed. White Laboratories, Inc., Pharmaceutical Manufacturers, Newark 7, N. J.

White's PRESCRIPTION *vitamins*



Plastic to the Rescue

In World War I, "Business as Usual" was among the most widely quoted slogans. The pace of that little conflict, terrific as it was for its day, was slow compared with the demands made on industry today. Today, industry is geared to production figures that soar into the astronomical; new uses have been found for all sorts of raw materials; every day is a challenge to our resourcefulness and inventiveness. . . Today, business is not *as usual;* furthermore it is not likely to return to that status: thousands of improvements engendered by war emergencies will evolutionize many industries when Peace is accomplished. Just a very small indication of this is hinted in the plastic lipstick container pictured above. When our pre-war supply of metal Wedding-Ring Lipstick containers was depleted, *plastic* came to the rescue with a container that we believe will meet your requirements from an aesthetic as well as a practical standpoint. This new lipstick should be available around the 15th of August (we hope)

Luzier's Fine Cosmetics and Perfumes Are Distributed In Minnesota By:

District Distributors

Louise Roberts
304 Medical Arts Bldg.
Minneapolis, Minn.

Mae Nagle
Ormonde Hotel
Virginia, Minn.

Kay McCarthy
Madelia, Minn.

Assistant District Distributor

Eva Byrne
610 3rd St. S.E.
Little Falls, Minn.



Announcement

We have been appointed distributors for the Michael Reese Research Foundation NORMAL HUMAN PLASMA AND SERUM —undiluted and diluted with normal saline. Accepted by the American Medical Association—in stock for prompt shipment. You run no risk—plasma and serum returnable for exchange at expiration date. Order today—keep a supply always on hand.

"Shock" demands Speed!

C. F. ANDERSON CO. INC.

Surgical & Hospital Equipment

Minneapolis • 901 Marquette Ave. • Minnesota

Established 1919



WHEN interviewed between platefuls, this 11-months-old young man emphatically stated: "I have been brought up on Pablum and still like it, but some days when I'm in the mood for oatmeal, nothing satisfies me like Pabena!"

Nutritious, quick and easy to prepare, both products are for sale at drug stores.

MEAD JOHNSON & COMPANY, EVANSVILLE, IND., U.S.A.



There's no rule about the length of a war, and no telling how great the sacrifices needed to win it. All we know is that it *must be won.*

We hope and pray that the *next* generation will be spared—that our lads of fourteen and fifteen are destined for something else but the horrors of war and the fields of battle.

We hope that we, of this generation, may transmit to the next generation a world in which ruthless savagery and killing have ceased . . . a world in which they may live and work in peace.

America must not lose this war—*dare* not lose it! We must win as *quickly* and completely as possible. If we win in time, hundreds of thousands of lives will be saved, and the youths of today will build the greater America of tomorrow.

It takes *money* to provide our fighting men with planes, tanks, guns and ships—tens of billions of dollars. It takes *War Bond* money—from you, and you, and you—regularly—every payday—10% of your income, at least—more, if you can.

Your Government will give you back $4 in 10 years for every $3 you invest now—$25 for each $18.75 Bond you buy. And your investment is backed and guaranteed by all the strength of the world's most powerful nation. The better we arm our *men,* the more lives of our *boys* will be spared, and the sooner will their future be assured.

Knowing this to be true—knowing that War Bonds will help save our country—the lives of our fighting men—yes, even the lives of those who are mere boys now . . .

Can you possibly *not* put every dollar you can scrape together into War Bonds?

FACTS ABOUT WAR BONDS

1. War Bonds cost $18.75 for which you receive $25 in 10 years—or $4 for every $3.
2. War Bonds are the world's *safest* investment — guaranteed by the United States Government.
3. War Bonds can be made out in 1 name or 2, as co-owners.
4. War Bonds *cannot* go down in value. If they are lost, the Government will issue new ones.
5. War Bonds can be cashed in, in case of necessity, after 60 days.
6. War Bonds begin to pay interest after 1½ years.

Keep on Buying War Bonds

PUBLISHED IN COOPERATION WITH THE DRUG, COSMETIC AND ALLIED INDUSTRIES BY
LEDERLE LABORATORIES, INC., NEW YORK, N. Y. — A UNIT OF AMERICAN CYANAMID COMPANY

Integrity



The RED LILLY stands for quality products, progress through research, and ethical dealing with the medical profession. These precepts are not an idle pose but are the basis on which the Lilly Laboratories have operated for over sixty-five years.

Lilly

ELI LILLY AND COMPANY

INDIANAPOLIS 6, INDIANA, U.S.A.

BUY WAR BONDS AND STAMPS

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 September, 1943 No. 9

THE DIFFERENTIATION OF ENDOMETRIOSIS AND CARCINOMA OF THE SIGMOID COLON

E. L. JENKINSON, M.D.
Associate Professor of Radiology, Medical School, Northwestern University
W. H. BROWN, M.D.
Chicago, Illinois

Introductory Remarks

Mr. President, I consider it a very great honor to be asked to deliver the tenth annual Russell D. Carman Lecture. I had the pleasure of knowing Dr. Carman and, like all who knew him, I held him in high esteem. The invitation to give this lecture has recalled and somehow strengthened my friendship with Dr. Carman and brings me closer to his memory.

At the premier lecture in 1934, such illustrious physicians as Dr. Donald Balfour and Dr. A. B. Moore enumerated his myriad accomplishments. It would be presumptuous of me to repeat what has already been so ably told.

With the passing of Dr. Russell D. Carman on June 17, 1926, medicine lost one of its pioneers in roentgenology and probably the most efficient fluoroscopist in the world.

• • •

AN early diagnosis of a malignancy is important to patient and physician. The favorable prognosis following surgical excision of localized malignancies of the colon requires diagnosis before these lesions become inoperable. The combined efforts of clinicians and roentgenologists often make this goal possible. Operative procedures for treatment of carcinoma comprise about 70 per cent of the total operations on the colon. In 1931, Rankin[11] in his review of 542 colon operations found carcinoma in 369 or 68 per cent. He classifies carcinoma of the large bowel and anus on a basis of their gross characteristics and microscopic anatomy as: (1) medullary adenocarcinoma; (2) scirrhous or fibrocarcinoma; (3) mucoid (colloid) adenocarcinoma; (4) papillomatous carcinoma; (5) squamous carcinoma; (6) melanoma.

The diagnostic value of roentgen studies of functional and organic disease in the gastro-intestinal tract and gall bladder is widely accepted among physicians today. Despite an increasing use of these diagnostic procedures, each portion of the gastro-intestinal tract still is commonly regarded as an isolated unit unrelated to other parts of the system. This erroneous attitude should be changed. The gastro-intestinal tract, including the liver, gall bladder, and pancreas, is one continuous system, each part having various specialized functions, but all intimately integrated by interrelated nervous, functional, and anatomic mechanisms. Functional or organic changes in one part of the gastro-intestinal tract readily cause disturbances in distant portions. The integrated physiologic and nervous interrelationship is an important factor in the protean and misleading symptoms and signs of gastro-intestinal tract pathology.

The most ominous lesions frequently have the least characteristic or localizing symptoms until advanced stages of the disease have produced irreparable damage. The pathologic lesion in the gastro-intestinal tract which cannot, at times, simulate at least several other distant lesions because of interrelated nervous and physiologic

Russell O. Carman Memorial Lecture delivered at the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, May 17, 1943.

mechanisms is rare. The importance of complete roentgen studies of the entire gastro-intestinal tract, including the gall bladder and colon, therefore, must be emphasized. So-called gastric symptoms in the presence of occult blood in the stools do not necessarily limit pathological lesions to the stomach or duodenum. Roentgen examination of the colon is essential regardless of a demonstrable peptic ulcer, for an inflammatory lesion in one part of the gastro-intestinal tract may obscure a malignant lesion in another part.

The distal half of the colon, including the rectum, evolves from the primitive hind gut. This discussion is confined to lesions of the rectum and sigmoid colon. The length of the rectum, estimated from 9 to 20 cm., is greater in males than females, greater in the aged than in the young, and may be influenced by distention. The term "rectosigmoid" may indicate the junction of the rectum and sigmoid colon or may indicate the sigmoid colon and the rectum. Many anatomists consider the third sacral segment the upper limit of the rectum. The sigmoid colon refers to the portion of large bowel between the left iliac crest and the rectum.

The differential diagnosis of constricting lesions of the sigmoid colon is presented in many medical texts and in medical literature. The increasing frequency of detailed roentgenologic studies of the gastro-intestinal tract of patients with vague digestive complaints makes possible a relatively accurate and early differential diagnosis of constricting lesions of the sigmoid colon. The prevalence of carcinoma of the sigmoid colon in patients less than forty-five years old is recognized. In the younger age groups the carcinoma is highly malignant. The urgent necessity of early and accurate diagnosis is evident.

The differential diagnosis of carcinomas of the sigmoid colon stresses the need of excluding most infectious and inflammatory diseases. But, the frequency of endometriosis causing constricting lesions of the sigmoid colon simulating carcinomas rarely is mentioned and never adequately stressed. Constricting endometrial lesions of the rectum and sigmoid colon occur only in women and often are confused with carcinoma. The patients sometimes are subjected to radical resection of the bowel,[2,3,5] whereas castration usually would suffice.

The frequency of endometrial implants on the rectosigmoid colon is demonstrated in a recent survey.[7] The clinical and roentgen characteristics as reported in medical literature and in the clinical and operative records of 117 patients at St. Luke's Hospital, Chicago, Illinois, from 1939 to 1941, inclusive, are reviewed. The subsequent statistical data are summaries of this report.

TABLE I. RELATIVE FREQUENCY OF RECTOSIGMOID ENDOMETRIOSIS (INCLUDING LESIONS OF THE SIGMOID, RECTUM, AND RECTOVAGINAL SEPTUM)

	Series Total	Rectosigmoid	Per Cent
Allen[1]	112	41	37.0
Cattell[3]	104	17	16.0
Counseller and Mason[4]	162	51	31.0
Keene and Kimbrough[9]	118	6	5.0
Jenkinson and Brown[7]	117	47	40.0
Total	613	162 (26%)	

Throughout this discussion, "endometriosis of the rectosigmoid" designates any endometrical lesion of the sigmoid colon, rectum, or rectovaginal septum which, by reason of its location, by various degrees of extension, or the associated inflammatory reaction could encroach upon the bowel lumen or constrict this portion of the colon or rectum. Extensive surveys by Green-Armytage,[6] Sampson,[12] and H. O. Jones,[8] indicate that approximately 15 per cent of all women develop pelvic endometriosis during their active menstrual life. Evaluation of 613 patients in five series (Table I) indicates that about 25 per cent of the women with pelvic endometriosis have lesions of the rectosigmoid.

By combining this figure with the previous estimate that approximately 15 per cent of all women develop endometriosis, it may be assumed that 2 to 4 per cent of all women during their active menstrual life may develop endometriosis of the sigmoid colon, rectum, or rectovaginal septum. At any of these sites it is a potential factor in causing a constricting or obstructing lesion of the colon and rectum. Endometriosis of the rectosigmoid is important, therefore, in the etiology of constricting rectosigmoid lesions during the active menstrual life.

The medical literature from 1931 has numerous case reports of partial or complete obstruction of the rectum or sigmoid colon caused by endometriosis. Only three series (Table II)

TABLE II. OBSTRUCTING RECTOSIGMOID ENDOMETRIOSIS

	Patients with Some Degree of Obstruction	Patients with Rectosigmoid Lesions
Cattell[3]	12	17
C. W. Mayo and J. M. Miller[10]	15	38
Jenkinson and Brown[7]	21	47
Total	48 (47%)	102

state the incidence of obstructing rectosigmoid endometriosis.

Constricting endometrial lesions of the sigmoid colon should be differentiated from carcinoma. Almost one-half of these patients having rectosigmoid lesions had a degree of constriction sufficient to produce symptoms at some time during active menstrual life. These lesions are more frequent than is usually believed for rectosigmoid lesions and bowel symptoms very often are subordinate to other symptoms of endometriosis and associated pelvic pathology.

The differential diagnosis of constricting lesions of the sigmoid colon depends upon a careful consideration of all clinical, laboratory, and roentgen findings. The following outline includes most of the constricting lesions of the sigmoid colon and rectum:

TABLE III. CONSTRICTING LESIONS OF THE SIGMOID COLON

I. Intrinsic Lesions
  A. Malignant lesions
    1. Adenocarcinomas
    2. Malignant polyposis
    3. Scirrhous carcinoma
  B. Inflammatory lesions
    1. Diverticulitis
    2. Ulcerative colitis
    3. Specific infections
      a. Amebiasis
      b. Syphilis
      c. Mycoses
      d. Lymphogranuloma
      e. Tuberculosis

II. Extrinsic Lesions
  A. Malignant lesions
    1. Carcinoma of ovary
    2. Kruckenberg tumor
    3. Lymphosarcoma
    4. Other metastatic malignancies
    5. Post-irradiation fibrosis of malignancies
  B. Inflammatory lesions
    1. Endometriosis
    2. Inflammatory or post-operative adhesions

The differential diagnosis of constricting lesions of the sigmoid colon in the preceding classification is based upon whether they are intrinsic or extrinsic and malignant or inflammatory. The term "intrinsic" designates pathologic lesions arising primarily in the structures of the bowel mucosa. "Extrinsic" indicates pathological lesions originating elsewhere and subsequently involving the bowel wall through the peritoneal cavity, lymphatics, or blood stream. Inflammatory lesions include those of infectious and non-infectious origin. Malignant lesions designate neoplastic tissues in which any inflammatory changes that may be present are subordinate.

The Clinical, Laboratory, and Roentgen Characteristics of Constricting Lesions of the Sigmoid Colon

The clinical, laboratory, and roentgen characteristics of constricting lesions of the sigmoid colon are based on the preceding classification.

Intrinsic Malignant Lesions

Adenocarcinomas, malignant polyposis, and scirrhous carcinomas constitute the majority of intrinsic malignant lesions.

1. *Clinical and Laboratory Characteristics of Less Advanced Lesions.*—Intrinsic malignant lesions are most frequent in patients over forty years old especially in males. Symptoms are usually of less than one year's duration except in malignant changes of polyps, when symptoms may be of many years' duration. There is no consistent periodicity of symptoms. Weight loss or cachexia is variable and when present usually indicates an advanced lesion. Fever is rare in the absence of complicating inflammatory changes or dehydration. Anemia without leukocytosis is more characteristic of advanced lesions. The most significant complaints are progressive constipation, changes in the bowel habits, or recurring bright red blood in stools. Frequent blood and mucus may predominate in the presence of multiple polyps having malignant changes. Gross red blood usually is present in stool examinations. Proctoscopic examination of accessible lesions reveals a fungating mass, an ulcerating tumor, or a rigid ulcerating stenosis.

2. *Roentgen Characteristics Revealed by Barium Contrast Enemas.*—Intrinsic malignancies

of the sigmoid colon cause a constant filling defect rarely more than two or three inches long. The bowel walls are irregular, jagged. The lesion is well-demarcated and often has rolled edges. The pathologic and the normal are usually sharply drawn. Destruction of the mucosa causes a ragged, moth-eaten appearance, except in rare instances of scirrhous carcinomas without ulceration, in which there is only an absence of mucosal folds. Fixation is rare in the absence of extension. Tenderness is present only with associated ulceration and secondary infection. Other portions of the colon have no consistent pathology except in the presence of polyps which are characteristically multiple and recurrent.

Intrinsic Inflammatory Lesions

Common intrinsic inflammatory lesions in the sigmoid colon include diverticulitis, ulcerative colitis, and amebiasis. Syphilis, mycoses, lymphogranuloma, and tuberculosis are relatively rare.

1. *Clinical and Laboratory Characteristics.*—Although this group has no consistent age range, diverticulitis is more common in patients over forty-five years of age, and ulcerative colitis in patients between twenty-five and forty-five years of age. The duration of symptoms is variable and usually of several or many years. There is no periodicity of symptoms. Weight loss or cachexia is rare in diverticulitis, may be moderate in amebiasis, and is frequently moderate or marked in ulcerative colitis. A low fever is not unusual. Anemia is rarely present in diverticulitis, but may be moderate or severe in ulcerative colitis or amebiasis. Leukocytosis is variable. The principal bowel complaint in diverticulitis is dull pain in the left lower quadrant of the abdomen; in ulcerative colitis, painful bloody diarrhea; and in amebiasis, an alternating constipation and painful diarrhea. Stool examinations reveal frequent gross blood, mucus, and pus. Organisms may be demonstrated in amebic infections. Proctoscopic examinations of accessible lesions reveal an inflamed mucosa. Patients with ulcerative colitis may have miliary abscesses and ulcers, whereas amebic infections usually have undermining ulcers of the mucosa.

Localized constricting lesions of specific infectious origin such as syphilis, lymphogranuloma, mycoses, and tuberculosis, are not common in the sigmoid colon. The clinical diagnosis is based usually on bacteriologic or serologic tests or evidence of the disease elsewhere.

2. *Roentgen Characteristics.*—Constricting le sions of the sigmoid colon caused by diverticuliti have ill-defined, irregular margins. The disease area gradually fades into the normal unlike ca cinoma. The constriction is of variable lengt depending upon the number of diverticula in flamed or the presence of an abscess. The plica are usually present and the walls are jagged an may have a saw-tooth appearance. The bowe wall may be serrated for four to six inches. In flammatory changes sufficient to cause constric tion usually have considerable tenderness an some fixation. Portions of the colon adjacent t the constriction often have diverticula. Ulcera tive colitis may cause a constant constriction i advanced stages. Multiple segments usually mor than three or four inches long are involved There is a complete disorganization of the mucosa Multiple ulcers in the earlier stages cause a shaggy appearance. In the late stages the mucosa is smooth and rigid. Fixation and tenderness ar usual. Lymphogranulomas of the rectum caus a disorganization of the mucosa similar to ulcerative colitis. The narrowing is usually of considerable length and the borders are well-defined and regular. Tenderness is common. Changes in the infrequent specific infectious lesions of the sigmoid colon are similar to ulcerative colitis and rarely differentiated.

Extrinsic Malignant Lesions

Extrinsic maligant lesions include carcinomas of the ovary, Krunckenberg tumors, lymphosarcomas, other metastatic malignancies, and post-irradiation fibrosis of malignancies.

1. *Clinical and Laboratory Characteristics.*—The extrinsic malignant lesions causing constriction of the sigmoid colon have no characteristic clinical or laboratory findings. The principal bowel complaint is variable and depends upon the degree of narrowing of the bowel lumen. Symptoms of a progressive bowel obstruction may be present. Stool examinations are usually negative. Proctoscopic examinations reveal a narrowing of the bowel lumen without changes in the mucosa. Evidence is usually present of a primary tumor or other metastatic lesions elsewhere.

2. *Roentgen Characteristics.*—Extrinsic constricting malignant lesions of the sigmoid colon cause a constant filling defect of variable length usually less than three inches. The borders are

TABLE IV. SIGNIFICANT DIFFERENTIAL CHARACTERISTICS OF CONSTRICTING LESIONS OF THE SIGMOID COLON AND RECTUM

CLINICAL CHARACTERISTICS

	Intrinsic Malignancies	Intrinsic Inflammatory	Extrinsic Malignancies	Extrinsic Inflammatory (Endometriosis)
ignificant owel complaints	Progressive constipation, change in bowel habits; red blood in stool	Variable—low abdominal pain, constipation; diarrhea etc.	Variable	Progressive constipation without gross bleeding
ge	More common over 40	Any age	More common over 40	Limited to active menstrual life
ex	More common in males	Either sex	Either sex	Only in females
Duration of ymptoms	Less than one year	Usually several years	Usually more than one year	Usually several years
roctoscopic ndings	Ulcerating mass; positive biopsy	Ulceration of mucosa and scarring	Stenosis with flattened mucosa	Narrowed lumen with intact mucosa
Other signs or ests	Cachexia, anemia, and other signs of malignancy only in advanced lesions	Bacteriologic, serologic, and special tests	Other signs of malignancy elsewhere	Associated menstrual abnormalities; exacerbation of bowel symptoms coinciding with menstrual periods

ROENTGEN CHARACTERISTICS

	Intrinsic Malignancies	Intrinsic Inflammatory	Extrinsic Malignancies	Extrinsic Inflammatory (Endometriosis)
Constancy of defect	Constant	Inconstant	Constant	Inconstant
Length	Usually 1 to 2 inches	Variable. Usually long	Usually 1 to 2 inches and fusiform	Usually long; 2—4 inches in advanced lesions
Borders	Irregular, but well-demarcated	Ill-defined and irregular	Smooth and regular	Regular and well-demarcated
Mucosa	Destroyed, ragged, and moth-eaten	Distorted or ulcerated	Intact and smooth	Intact, normal folds
Tenderness	Minimal	Moderate or marked	Minimal	Moderate or marked
Fixation	Minimal	Variable	Moderate or marked	Moderate or marked

sharp and regular. The mucosa is smooth and intact. Fixation without tenderness is usual.

Extrinsic Inflammatory Lesions

Extrinsic inflammatory lesions include endometrial implants and inflammatory or postoperative adhesions.

1. *Clinical and Laboratory Characteristics.*—The more common clinical characteristics of constricting endometrial lesions of the sigmoid colon and rectum include an age range, usually between twenty-five and forty-five years; high incidence of menstrual abnormalities; absolute or relative sterility; long history of bowel symptoms suggesting progressive obstruction with frequent exacerbations at menstruation; absence of cachexia or weight loss; infrequent gross or occult blood in the stool in the absence of other anorectal pathology; high incidence of associated benign uterine tumors; and demonstration of narrowed bowel lumen with intact mucosa when the lesion can be reached with the sigmoidoscope. Inflammatory adhesions may have similar symptoms. The history of a previous surgical operation may be significant.

2. *Roentgen Characteristics.* — The roentgen findings of the more advanced constricting endometrial lesions of the sigmoid colon and rectum include a filling defect approximately four to seven inches long, a sharp demarcation of this filling defect similar to carcinoma, little evidence of disease in other portions of the colon, an essentially intact mucous membrane, and fixation and tenderness to palpation during fluoroscopic examination. Smaller implants cause a well-demarcated, localized, irritable segment, sometimes less than an inch long and tender on palpation, especially before or during menstruation. Other portions of the colon are relatively free from spasm, irritability, or demonstrable pathology. The clinical history is important in order to obtain a correct diagnosis in less advanced lesions. Small endometrial implants should not be mistaken for malignancies, but easily are confused with recurrent colospasm interpreted on the basis of a probable diverticulum.

Correlation of Important Differential Criteria

The prime objective in the differential diagnosis of constricting lesions of the sigmoid colon and rectum is the recognition of intrinsic malignancies. Diagnostic roentgen procedures are quite reliable in differentiating early intrinsic malignant lesions from other constricting lesions. Adequate surgical procedures offer the best chance of recovery but demand early diagnosis, especially in young individuals. Careful surgery, however, requires reasonable exclusion of non-malignant lesions before extensive resection or excision of the affected colon is performed. Many clinical characteristics are late manifestations. Reliance on many characteristic diagnostic criteria of intrinsic sigmoid colon malignancies is not feasible in obtaining an early diagnosis.

The most valuable clinical criterion of intrinsic malignant constricting lesions is a progressive constipation or change in the bowel habits with recurrent bright red blood in the stools. Proctoscopic and roentgen studies are mandatory. Negative biopsies of accessible lesions are not always conclusive. The important roentgen findings include a short constant filling defect with well-defined margins, jagged and irregular walls; ragged, moth-eaten, destroyed muscosa; and slight fixation or tenderness.

Intrinsic inflammatory lesions should be differentiated clinically by long duration of symptoms, frequent fever, pain in the lower left abdomen, and bacteriologic and serologic tests. Roentgenologically, the constricting lesions are relatively long and the caliber inconstant, the margins are ill-defined and irregular, considerable tenderness is common, and similar changes usually are present in other portions of the colon.

Extrinsic malignancies causing constricting lesions of the sigmoid colon may be differentiated clinically by other evidence of primary or metastatic tumors. Roentgenologically, the filling defect is short and the caliber constant, the margins are smooth and regular, the mucosa is intact and smooth, and there is a definite fixation without marked tenderness.

Constrictions caused by endometrial implants are rarely recognized and frequently are mistaken for intrinsic malignancies. The similarities and differences must be carefully evaluated as endometrial lesions have characteristics in common with tumors and inflammatory lesions. The clinical differentiation is based on absence of gross bleeding per rectum not accounted for by other ano-rectal pathology, a relatively long duration of symptoms and frequent exacerbations coinciding with menstruation, a limitation to women in active menstrual life, and frequent association of sterility and menstrual abnormalities. The more advanced endometrial lesions are differentiated roentgenologically by a relatively long inconstant filling defect with regular borders, intact mucosa, considerable fixation, and marked tenderness. Postoperative roentgen examination of the colon is valuable to demonstrate restoration of the bowel lumen following simple castration in cases of endometriosis.

An accurate differential diagnosis of constricting lesions of the sigmoid colon and rectum is usually difficult and requires the combined efforts of clinician, roentgenologist, and pathologist in an exhaustive diagnostic study of the patient.

Bibliography

1. Allen, E.: A clinical and experimental study of endometriosis. Am. J. Obst. & Gynec., 26:803, 1933.
2. Bartlett, R. W.: Endometriosis of sigmoid. Am. J. Surg., 29:122, (July) 1935.
3. Cattell, R. B.: Endometriosis of colon and rectum with intestinal obstruction. New England J. Med., 217:9, (July 1) 1937.
4. Counseller, V. S.: Endometriosis—A clinical and surgical review. Am. J. Obst. & Gynec., 36:877, 1938. and Masson, J. C.: Surgical significance of endometriosis. Ann. Surg., 102:819, 1935.
5. Dukes, C. E.: Endometrioma of pelvic colon. Proc. Roy. Soc. Med., 31:693, (April) 1938.
6. Green-Armytage, V. B.: Endometriomata: the five clinical types. Brit. M. J., 1:602, (April 8), 1933.
7. Jenkinson, E. L., and Brown, W. H.: Endometriosis: A study of 117 cases with special reference to constricting lesions of the rectum and sigmoid colon. J.A.M.A., 122:349, (June 5) 1943.

8. Jones, H. O.: Personal communication.
9. Keene, F. E., and Kimbrough, R. A.: Endometriosis—a review based on the study of one hundred and eighteen cases. J.A.M.A., 95:1164, (Oct. 18) 1930.
10. Mayo, C. W., and Miller, J. M.: Endometriosis of sigmoid, rectosigmoid and rectum. Surg., Gynec. & Obst., 70:136, (Feb.) 1940.
11. Rankin, F. W., and Graham, A. S.: Cancer of the Colon and Rectum. Chap. III, p. 67; Chap. V, p. 109. Springfield, Illinois: Charles C. Thomas, 1939.
12. Sampson, J. A.: Perforating hemorrhagic (chocolate) cysts of the ovary, their importance and especially their relation to pelvic adenomas of endometrial type. Arch. Surg., 3:245, 1921.

Benign and malignant endometrial implants in the peritoneal cavity and their relation to certain ovarian tumors. Surg., Gynec. & Obst., 38:287, 1924.

Endometriosis of the sac of a right inguinal hernia, associated with a pelvic peritoneal endometriosis and an endometrial cyst of the ovary. Am. J. Obst. & Gynec., 12:459, 1926.

Metastatic or embolic endometriosis due to the menstrual dissemination of endometrial tissue into the venous circulation. Am. J. Path., 3:93, 1927.

Peritoneal endometriosis due to the menstrual dissemination of endometrial tissue into the peritoneal cavity. Tr. Am. Gynec. Soc., 52:171, 1927.

PRACTICAL APPLICATIONS OF A ROUTINE BLOOD COUNT IN THE NEWBORN

With Special Reference to the Obstetrical Nursery

FRANK C. NEFF, M.D.

Kansas City, Kansas

THERE is a steady increase in the number of infants delivered in the hospitals, whether in the cities or smaller communities. Most hospitals have an obstetrical nursery, and the retention of the newborn there gives the opportunity to utilize such a valuable procedure as a routine blood count and hemoglobin estimation in every case. Not only should the presence of congenital heart and other abnormalities be a matter of record available for the physician who sees the child early as well as later, but by this procedure the existence of anemia in the newborn, though previously regarded as rare, will be uncovered more frequently. Life-saving measures even may be carried out. The obstetrical nursery should be even more of a factor in the reduction of infant mortality.

When one recalls the unexplained deaths in the newborn in the first twenty-four hours, I believe closed detailed observation based on our growing knowledge will result in considerable benefit.

Nearly twenty years ago Russel Haden,[2] while a member of our faculty, made a detailed study of the blood in newly born infants and reported the difference in the number of red cells in venous and peripheral blood, along with the study of total cells and other features. This stimulated us to make a simple red count on all newborn infants in our nursery and this has been carried on for several years.

I wish to present two tables, the first one adapted from the textbook of Holt and McIntosh. The second is from a short study recently of thirty normal newborn infants in our nursery.

From the Department of Pediatrics, School of Medicine, University of Kansas, Kansas City, Kansas. Read at the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, May 18, 1943.

TABLE I. NORMAL BLOOD VALUES AT NEWBORN PERIOD

Adapted from Holt and McIntosh

Age Days	R.B.C. (Millions)	Hb. Gm.	Reticulocytes %	W.B.C.	Polys	Platelets
1	4.8—6.2	18—23	2—5	20,000	70	350,000
14	4.5—5.5	15—20	0.2	12,000	31	300,000

TABLE II. BLOOD FROM THIRTY NORMAL NEWBORN INFANTS*

Age Days	R.B.C.	Hemoglobin		Reticulocytes %	Nucleated Reds
		%	Gm.		
1	5,433,333	108	16.9	3.7	7 (total)
10	5,012,083	100	15.0	1.2	0

Holt and McIntosh state that considerable deviation in the total red cells may occur in either direction without overstepping the normal limits. Notice that the percentage of reticulocytes drops from an average of 5 to 2 per cent on the first day to 0.2 per cent on the fourteenth day.

Anemia is of infrequent occurrence in the neonatal period. In a few cases it is due to infection. Josephs,[3] who has probably written as much on anemias of early childhood as any one investigator, has stated that a number of abnormally low values for hemoglobin and erythro-

*In determining the hemoglobin of newborn infants, which is often over 100 per cent, the blood is drawn up to the 0.25 mark on the white pipette instead of the 0.5 mark which is ordinarily used. This is then diluted with N/10 HCl up to the 11 mark, giving a 1:40 dilution instead of the usual 1:20 dilution. When this is placed in the Hayden-Hauser hemoglobinometer, the results are read, doubled and one gram is subtracted. We have found that merely doubling the reading does not check with a hemoglobin taken up in the normal manner. Beryl Powell, M.T., (A.S.C.P.), University of Kansas Hospitals Laboratory, Kansas City, Kansas.

cytes may appear in a large series of newborns, which may be regarded as taking place sooner than usual for such low values. He concluded that one could not make a clear demarcation as to where the normal began or left off.

Report of Cases

Case 1.—Baby Palmerton, newborn, gained 100 gm. over the birth weight in the first two weeks of life; was noticed to have a mild icterus during the newborn period but with the red cells 7,000,000 and the hemoglobin 17 gm. The cord Wassermann had been negative. The infant gave no suggestion of more than a mild physiological jaundice during the newborn period. The recording of the routine blood count at birth proved to be valuable for comparison when the moderate anemia appeared a few weeks later.

About the fourth week of life the mother noticed the child's stools were white and the urine quite yellow, the scleræ yellow-tinted. At five weeks jaundice was noticed which thereafter increased steadily. The skin became dry and inelastic, the child dehydrated. The liver began to be palpable. The red count was 3.7 million; stools contained no bile or urobilinogen, the icteric index 30 and within a few days 50. Exploratory operation and biopsy showed obstructive biliary cirrhosis.

The routine determination of the red blood count and hemoglobin in the newborn ruled out anemia at that period. The early jaundice could have been differentiated as obstructive rather than physiological and hemolytic. Furthermore, the differentiation of excessive hemolysis in certain infants and the resultant anemia from obstructive abnormalities of the liver in certain other infants should be made at the earliest possible time.

Jaundice as a symptom in the newly born period, if very marked, is apt to receive an earlier recognition than the early pallor of anemia. In the case reported by Sobel,[4] no mention was made of the blood count during the newly born period, but the report states that pallor was masked by the icterus when the infant was examined at about three weeks of age.

Case 2.—Anemia[1] was recognized on the sixth day of life. This baby appeared normal at birth, but treatment could have been started earlier if the nursery had made a routine count. The mother had a normal hemogram during pregnancy and at the time of delivery; she had borne one normal child. The infant showed no gross evidence of hemorrhage or jaundice leading to anemia. The blood was counted on the sixth day of life, at which time marked pallor was recognized and the following formula was obtained:

Baby R. E. W., aged six days. Red blood count, 2,160,000; nucleated reds (erythroblasts), 0; hemoglobin, 47 per cent (7.3 gm.); reticulocytes, 0.1. No enlargement of liver or spleen.

TREATMENT SERIES AND EFFECT UPON THE BLOOD PICTURE

Treatment	Age Days	R.B.C.	Hb. %	Hb. Gm.	Retic.
Transfusions	6	2,100,000	47	7.3	0.1
	7	2,500,000	54	8.5	
	8	2,500,000	47	7.3	
	9	3,500,000	63	9.8	
	20	2,300,000	43	6.7	0.3
	30	1,900,000	32	4.9	1.4
	37	1,600,000	30	4.7	1.4
An immediate reticulocyte response begins here:					
Liver Extract	40 days	1,300,000	33	5.1	8.4
	6 wks.	3,200,000	48	7.5	9.2
	7 wks.	2,400,000	49	7.6	4.6
	9 wks.	2,400,000	48	7.5	9.0
	10 wks.	2,300,000	45	7.0	7.0
	3 mos.	3,000,000	59	9.2	1.0
	4 mos.	4,300,000	74	11.5	1.5
	5 mos.	4,200,000	77	12.0	
	6 mos.	4,250,000	78		1.8

Diagnosis: Nonerythroblastic anemia of the newborn.

This little boy's condition has been followed for three years and he has had a normal hemogram and physical condition ever since his treatment for anemia in infancy.

Case 3.—Baby girl L was normal in weight at birth. The blood count was normal and no general disturbance was noticed until the seventh day when she regained her birth weight and thereafter several ounces daily. This was recognized as abnormal and possibly due to invisible edema. By the seventh day the red blood count had dropped to 3,510,000, hemoglobin was 10.8 gm., but there was only one nucleated red cell. At twelve days edema appeared in the eyelids, then became general and within a few days the abdomen was greatly distended. The heart shadow became quite large and was considered to be due to pericardial effusion. The suggested diagnosis of hydrops was ruled out by the normality of the child in the first few days, the duration of life being until the eighteenth day. There was no heart murmur although fluoroscopy suggested a congenital abnormality of development. At autopsy the heart was found to possess only three chambers which made clear the diagnosis of edema of cardiovascular origin. The anemia was secondary.

Case 4.—Baby girl Harris, Negro, was born at full term, normal delivery. Physical examination revealed a female infant, normal except for a slight icterus. Birth weight was 3,020 grams.

Blood count the day after birth showed 2,690,000 red blood cells with 63 per cent hemoglobin. A detailed study of the blood is given in the accompanying table.

Age Days	R.B.C. (Millions)	Hemoglobin %	Hemoglobin Gm.	Nucleated Reds	Retic.	W.B.C.
2	2.4	63	9.7	56	2%	28,000
5	2.5	61	9.5	68		40,800
7	2.4	52	8.2	3		8,900
9	2.6	47	7.3	0		10,570
25	2.6	49	7.7	0		
58	3.2	56	8.7	0	4%	6,550

The red blood count and hemoglobin, shown above, remain almost constant. The erythroblasts, however, promptly disappeared and have not returned. There was no sickling. The child has shown a steady increase in weight and is in good condition otherwise. Treatment has consisted of liver extract injections, blood transfusions, inorganic iron, and normal diet.

Case 5.—Baby B. was born at one o'clock a.m., with a normal delivery and no birth injury. At three hours of age she began to develop dyspnea and cyanosis which became so severe that it was necessary to keep her in the oxygen tent. There was no explanation of the cyanosis. Sometime during the day it was noticed that there was slight edema of the ankles. The necessity for giving continuous oxygen made any attempt at examination impossible. At about nine hours of age a complete blood count was asked for, as was a blood smear. The blood count was normal for that period but the differential showed 24 per cent of enucleated red cells. The child died at twelve hours of age from unrelievable cyanosis and heart failure. The autopsy showed normal heart and lungs; unfortunately, there was no examination of the liver. Diagnosis: Erythroblastosis fœtalis.

In such a case it is difficult to determine the pathologic state present. It would seem that the defective oxygen carrying power of the large number of erythroblastic cells was the cause of the cyanosis, a condition incompatible with living.

Conclusion

We have had, in our nurseries, all three of the clinical entities of erythroblastosis fœtalis; namely, universal edema of the fetus (hydrops), icterus gravis neonatorum and the above mentioned anemia of the newborn. The relationship of the Rh factor, announced in 1940, is being discussed frequently in recent literature. The study of the presence of immune agglutinins originating in the mother and reaching the infant by way of the placenta with the influence upon the blood of the fetus calls for a wider determination of familial blood conditions. This should result in the early examination of the child's blood. It has been suggested that the affected mother be given a suitable transfusion from time to time

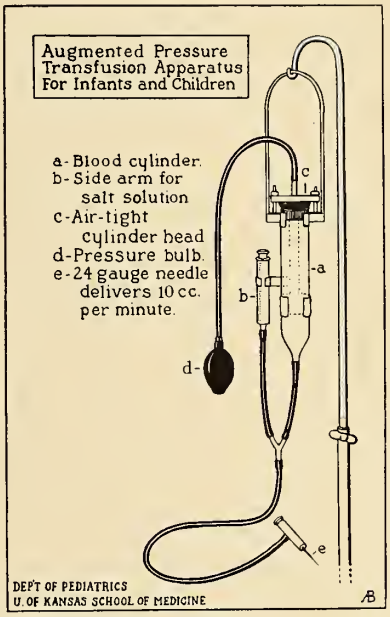


Fig. 1.

during pregnancy in order to prevent miscarriage. Undoubtedly, the infant at birth will have the advantage of a transfusion at the earliest moment if any of the clinical manifestations of erythroblastosis fœtalis are present.

The accompanying illustration is a drawing of a transfusion set which makes possible, at least in experienced hands, the fairly simple transfusion of newborn infants without cutting down on the veins. With this apparatus, one uses the small vessels of the scalp, wrist or ankle, in case the jugular, elbow or femoral veins are not successfully entered. Even with a needle as small as a 25 gauge it is usually possible to introduce citrated blood or plasma at the rate of 10 c.c. per minute, thus requiring only five to ten minutes for the amount needed in a young infant.

References

1. Dwyer, Hugh L., and Neff, Frank C.: Anemia of the newborn. Southern Med. Journal, 33:246, (March) 1940.
2. Haden, Russel L., and Neff, Frank C.: Volume index and color index of red blood corpuscles in newborn infants. Am. J. Dis. Child., 28:458, (Oct.) 1924.
3. Josephs, H. W.: Anemia of infancy and early childhood. Medicine, 15:307, 1936.
4. Sobel, Irwin Phillip: Icterus gravis neonatorum. Am. J. Dis. Child., 51:102, 1936.

TRANSURETHRAL RESECTION

Autopsy Findings in Twenty-six Cases

ARTHUR N. COLLINS, M.D.
Duluth, Minnesota

INCREASING numbers of older men are coming to the urologic surgeon for relief from prostatic obstruction. These patients are past the "prime of life" and most of them have acquired an assortment of degenerative pathologic conditions which, in themselves, are sources of physical embarrassment, in addition to the prostatism from which they seek relief.

It was out of curiosity concerning the identity of these associated conditions and their possible influence on the prostatic patient that this review was undertaken. The material for this study consists of twenty-six cases of prostatic obstruction in which transurethral resection was done by several operators in St. Luke's and St. Mary's hospitals and in which death occurred and autopsy findings were obtained. During the period in which these deaths occurred, there were approximately 800 transurethral resections. Deaths without autopsies are not included.

A glance at the tabulations submitted with this report will reveal the wide variety of pathologic findings which accompanied prostatism in these twenty-six patients.

Twenty-two of these twenty-six patients were in the seventh and eighth decades. Eighteen had hypertrophy while eight had carcinoma. Carcinoma did not occur under the age of sixty. It occurred four times in the seventh decade, twice in the eighth and twice past the age of eighty.

It is, therefore, between the ages of sixty and eighty, at which time most of the prostatism occurs, that we commonly find the results of bodily wear and tear, or better, the end-products of organic deterioration.

It would be better for such patients to present themselves for observation and treatment in the decade between fifty-five and sixty-five. Less treatment would be necessary at this age, even though less imperative, and associated pathologic processes would be less developed.

Arteriosclerosis was almost invariably found at autopsy but was sometimes not mentioned in the protocols. Considering the many regions in which arteriosclerosis manifests itself, it is of interest that no case of cerebral death occurred in this series. One coronary death is recorded. This was from coronary embolism. The source of the embolism was recorded as in the fine granular vegetations found on the mitral valve.

TABLE I. LESIONS OF CIRCULATORY SYSTEM
PERCENTAGE ON BASIS OF
TWENTY-SIX CASES

	No.	Per cent
Arteriosclerosis of aorta	15	58
Coronary sclerosis	13	50
Cardiac dilatation	6	23
Cardiac hypertrophy	6	23
Myocardial fibrosis	5	
Endocarditis	2	
Abscess of heart	1	
Aneurism of aorta	1	
Coronary embolus	1	
Pericarditis	1	

Myocardial fibrosis was found in five or approximately one in five cases. Only in the coronary embolism case, however, was it associated with the primary cause of death. Coronary sclerosis was sufficiently obvious to be recorded in 50 per cent of the cases. Chronic hypertrophy or dilatation of the heart was present in 46 per cent.

TABLE II. LESIONS OF RESPIRATORY SYSTEM

Bronchopneumonia	12
Edema of lungs	6
Emphysema	3
Bronchitis (purulent)	2
Infarct (pulmonary)	2
Pulmonary embolism	1

Bronchopneumonia may be questionable as a prominent factor in the cause of death; especially so at the present time when the sulpha drugs are being used for their antibacterial effect in the urinary tract. Pulmonary embolism was the primary cause of death in but one patient.

In four cases, gallstones were found at autopsy; in three additional cases cholecystitis was present, making a total of seven cases with chronic gall-bladder disease, or about 27 per cent. Probably any other group of the same age would

Presented before the Duluth Surgical Society, January 28, 1943.

TABLE III. LESIONS OF GASTRO-INTESTINAL SYSTEM

Gallstones	4
Cholecystitis	3
Duodenal ulcer (old)	3
Diverticuli—sigmoid	2
Carcinoma of stomach (primary)	1
Diabetes	1
Hernia (inguinal)	1
Hernia (umbilical)	1
Ileus	1

have at least the same rate. Therefore this finding may be regarded as incidental. Only one patient had diabetes. In this patient a suprapubic cystotomy was done because of bleeding and clot formation which occurred nine days after resection.

Hernias are common in prostatics and these hernias tend to increase in size as the bladder obstruction increases. Straining to void the urine accounts for this complicating factor.

Carcinoma of the stomach was found as a primary condition in one case. This was in a man of sixty-four with hypertrophy of the prostate. No carcinomatous involvement was found in the prostate. He stated he had been treated for pernicious anemia over a period of three years. In review of the history, he had shown a typical response to liver extract when first treated and an accompanying typical blood picture of pernicious anemia. Pneumonia was given as the cause of death. The relationship between primary carcinoma of the stomach and pernicious anemia, as recognized clinically, has been mentioned on several occasions in medical literature.

TABLE IV. MISCELLANEOUS FINDINGS

Arthritis	5
Septicemia	5
Obesity	4
Abscess—pelvic	3
Infarct—spleen	2
Peritonitis	2
Abscess—spleen	1
Anemia—pernicious	1
Cleft palate and hare-lip	1
Encephalomalacia	1
Myelin tract degeneration	1

Of the miscellaneous findings at autopsy, probably septicemia, pelvic abscess and peritonitis are more closely linked to the patient's prostatism. It is not uncommon to find the periprostatic venous plexus thrombosed. In the cystitis cases such venous stasis is the source of pericystic infection leading to pelvic abscess. Peritonitis and septicemia may therefore supervene and progress to terminate the patient's life.

TABLE V. LESIONS OF URINARY TRACT PERCENTAGE ON BASIS OF TWENTY-SIX CASES

	No.	Per cent
Cystitis	20	80
Pyelonephritis	11	42
Diverticulosis-Bladder	4	
Abscess of kidney	3	
Arteriosclerotic kidney	2	
Calculi of bladder	2	
Hydronephrosis	2	
Hydro-ureter	2	
Uremia	2	
Abscess of bladder wall	1	
Carcinoma of bladder	1	
Carcinoma of seminal vesicle	1	
Hypernephroma	1	
Nephritis—(Embolic)	1	
Nephrolithiasis	1	
Perforated bladder	1	
Pyonephrosis	1	
Urethritis	1	

Lesions of the Urinary Tract

This group is entitled to the closest scrutiny of all. Cystitis heads the list and was found at autopsy in twenty of the twenty-six cases. Local infection is a dread spectre to the urologic surgeon. Indwelling catheters are often very necessary if not imperative for bladder drainage. Skilled hospital assistants, such as orderlies, are scarce but important to the urologist's work especially in the care of prostatics. A patient may be admitted with clear urine but if his period of preparation is unduly prolonged because of cardiac or other factors, and continuous bladder drainage becomes necessary, the bladder is often infected through muddled manipulations by the time the patient is ready for transurethral resection. The most incessant care, competent medication and scrupulous technique are necessary in the conduct of such cases.

Abscess of the bladder wall occurred in one patient. This was an abscess posteriorly at the lower part of the bladder which ruptured into the bladder cavity. The abscess involved the bladder and rectum. The prostate was about six times the normal size and its lateral lobes were prominent.

Pyelonephritis constitutes a handicap right from the beginning of treatment. It is the com-

monest form of renal infection and occurred in 42 per cent of the patients. These patients showed evidences of long-standing infection due, of course, to obstruction and bladder retention before coming under observation. When artificial drainage of the bladder is done the pyelonephritis should begin to improve at once. However, some were badly infected and in three there were abscesses of the kidney. Two had hydro-ureter and two had hydronephrosis.

Two patients died uremic deaths. Renal disturbance in prostatism, according to Lich,[2] is primarily a tubule dysfunction. The function is definitely improved by continuous vesicle drainage but the renal damage, due to prostatism, is only partially reversible. Reëstablishment of function is not complete but reaches a peak beyond which no further functional improvement occurs. Depleted renal function is one of the major handicaps to prostatic surgery.

There was but one case of nephrolithiasis in this series. This may have been a silent stone. There was no history of renal colic and no evidence on physical examination of a mass or of tenderness on Murphy percussion. Pyonephrosis occurred in one patient and also hypernephroma once. One patient had carcinoma of the bladder with involvement of the seminal vesicle.

One case of perforated bladder was charged off as a surgical accident. This resulted in peritonitis. The pathologist at one of our hospitals made the comment that when examining these bladders after transurethral resection he had often found at the margin where the vesical mucosa and the prostate meet a hiatus of greater or less degree where removal of tissue had encroached on the trigone somewhat. In an already infected bladder this may be the point where infection invades more deeply into the pelvis.

Clinical Conduct

An average of 6.5 days were used for preoperative observation and preparation. One patient was in the hospital for two months before operation was undertaken. Several were hospitalized seven to fifteen days before operation was attempted. From this it would seem the patients were not rushed to the operating table with undue haste.

The residual urine on admission was considerable in most of the cases. Often a full bladder was recorded with 600 c.c. or more of residual urine. In only two cases was the residual urine recorded as less than 100 c.c.

The blood urea on admission was satisfactory in most of the cases—ranging from 11 to 30 mg. per cent. In six cases, however, toward the end of the hospital stay, when the patients became more toxic, the urea readings rose to above 40 mg. per cent. The creatinine readings were not always in direct proportion to the urea. As examples, one urea reading was 75 mg. while the creatinine stood at 2.14 mg., whereas in another case the urea was 44 mg. and the creatinine was 8.0 mg. No operations were done at a time when the urea readings were 40 mg. or higher.

Electrocardiograms were recorded in eight cases. In no case was an opinion given as a warning against surgery. Levitt and Carter[1] studied the status of electrocardiograms in association with 511 patients having prostatic obstruction and found 179 had abnormal electrocardiograms. Sixty-four of the 179 were free of clinical findings of cardiovascular disease, the electrocardiogram being the sole evidence of any disease. The question arises as to the validity of the electrocardiographic approach in surgical prognosis. These are in a sense mandatory surgical cases. Obstruction is present. These patients may die if operation is done for relief, but they may die if operation is not undertaken. For many years I have laid more stress on how much the patient has been able to do in his daily routine before coming under observation for his prostatism, than on the electrocardiogram or, as a rule, on his heart murmurs. A bedridden patient or one with a decompensated heart is of course a bad risk for any surgical operation and the bedridden prostatic is no exception.

Seventeen patients had a spinal anesthesia under 75 mg. of procain or more. Two were operated upon under nitrous oxide gas. All the other patients received 50 to 75 mg. of spinal anesthetic.

One patient had a convulsion on the operating table during the fourth attempt at resection and died within five minutes. He had received the same preparation used in all the other patients and was given 75 mg. of procain as a spinal anesthetic. At autopsy his coronaries were not occluded and there was no pulmonary embolism found. The urea was 18.3 mg. on admission. Two weeks later it was 20.8 mg. and the

creatinine 1.6 mg. This may possibly be charged off as an anesthetic death. In further discussion of this case the pre-operative daily blood pressure readings had been running between 150/64 and 110/46. At the first operative stage the initial blood pressure was 140/90 and was stabilized during operation at 130/80. At the second stage the initial blood pressure was 80/58. After supportive medication was given the blood pressure rose to 118/78 and was stabilized around 100/70. At the third stage the initial blood pressure was 110/50. During the operation the pressure fell to 70/45 but after giving supportive medication it was stabilized around 100/60. At the fourth stage (about ten days later) the initial blood pressure reading was 110/70. About fifteen minutes later it was 130/70; after twenty minutes—total time after the spinal anesthetic had been administered—the blood pressure read 116/68. Very shortly after this reading, convulsive movements of the right upper extremity occurred and the patient died. The notations on the anesthesia sheet written at the time by the anesthetist, are as follows: "Patient alert but apprehensive. Spinal anesthesia effective. No complaints. Pulse rapid, good quality. Color good. At 9:25 patient suddenly had jerky movements of right arm. Eyes rolling. Did not respond. Unable to feel pulse. Blood pressure inaudible. Ceased breathing. Artificial respiration given; oxygen and carbon dioxide and stimulants ineffective."

Convulsions during anesthesia is a subject rather widely discussed by Lundy,[3] Monroe and Benjamin[4] and many others but exclusively with respect to general anesthesia. One hundred sixty or more cases have been reported, about 53 per cent of which occurred in children. I have not found any reference to convulsions and death occurring under spinal anesthesia, however. Administration of a barbiturate to counteract the convulsion is recommended but giving the barbiturate before administration of the anesthetic is no doubt the safest procedure.

Eighteen patients had a single-stage operation. Seven had two-stage operations. Only one had a four-stage operation and on review it is believed this patient might properly have been a case for enucleation instead of for transurethral resection. The prostate was very large and, at autopsy, separated rather easily from its capsule.

In two cases the first microscopic reports were benign hypertrophy but later, at autopsy or after subsequent resection, carcinoma was found. In these two instances the first sections were reviewed and found to be as originally reported.

The operating time in twelve cases was less than forty-five minutes. In fourteen cases the operating time was fifty-five minutes or more. Several (in two-stage operations) had an operating time of sixty minutes or more, usually in the second stage. One operator of my acquaintance is going over his figures on transurethral resections found that the mortality varied directly as the time consumed beyond forty minutes.

Summary

The fact that these patients were for the most part over sixty years of age, and were found to have so many debilitating, degenerative conditions, indicates the seriousness of the surgical risk. They should without doubt come for treatment earlier in life. They should not be allowed to wait until compelled to consult the physician because of acute bladder obstruction. The presence of carcinoma would thus be discovered earlier and appropriate treatment for this condition applied. Pyelonephritis would be found less frequently. Fewer patients would need multiple stage procedures and all would be, for the most part, better able to stand surgical operation.

References

1. Levitt, R. O., and Carter, J. B.: Electrocardiography in surgical treatment of prostatic obstruction. Urol. & Cut. Rev., 46:505, (Aug.) 1942.
2. Lich, R.: Renal dysfunction in prostatism. Surg., Gynec. & Obst., 74:475, (Feb.) 1942.
3. Lyndy, J. S.: Convulsion associated with general anesthesia. Surgery, 1:666-687, 1937.
4. Monroe, S. E., and Benjamin, E. L.: Convulsions associated with general anesthesia. Am. J. Surg., 53:172-176, 1941.

VITAMIN PILLS MAKE WORKERS MORE NUTRITION CONSCIOUS

Despite oft-repeated claims that vitamins given to workers as an everyday nutrition aid cause reliance on pills instead of proper food, practical experience suggests that just the reverse is true, maintains Dr. K. Hickman, director of research for Distillation Products, Inc. (See *SNL*, July 31)

His firm has distributed a poly-vitamin supplement daily to its workers, producing a good effect on morale and arousing an interest in the science of nutrition among those who were previously careless and ignorant of the nutritive value of food.

"We find," Dr. Hickman declared, "that persons who have never given a thought to the nutrition value of their diet become nutrition conscious when taking vitamin pills."—*Science News Letter*, August 28, 1943

DAMAGE TO THE SPINAL CORD AND MENINGES FOLLOWING SPINAL ANESTHESIA—A CLINICO-PATHOLOGICAL STUDY

GORDON R. KAMMAN, M.D., F.A.C.P.
Saint Paul, Minnesota
and
A. B. BAKER, M.D., Ph.D.
Minneapolis, Minnesota

THOUSANDS of spinal anesthetics have been used without resultant damage to the central nervous system. Sullivan[21] described a patient with a ureteral stone who was given a spinal anesthetic five times within thirty-eight hours without ill effects. Babcock[1] used spinal anesthesia eleven times in one patient and noted no neurologic complications. One of us[6] injected spinocain into a patient three times in six months for the relief of gastric crises of tabes dorsalis. In spite of the fact that this patient's spinal cord had already been severely damaged by syphilis, there was no clinical evidence of increased cord injury. It was evident, however, that the drug did temporarily affect cord function because pain and vomiting disappeared immediately after the administration of the spinocain.

It seems inescapable that any process that produces such extensive clinical involvement of the nervous system as spinal anesthesia must produce in order to be effective, must result also in some anatomic alterations to these tissues in spite of apparently complete functional recovery. Many reports are now available in the literature emphasizing the potential damage of this type of anesthetic. Boisseau[2] reported the case of a young woman who, after spinal anesthesia, developed severe lacinating pains in the perineum, anal canal and genitalia, difficult micturition, and anesthesia of the sacral areas which persisted for twenty-two months and did not respond to any form of treatment. Koster and Weinrob[9] recorded a case of fatal paraplegia following spinal anesthesia which resembles in many respects the case that we are about to describe. Nonne and Demme[14] described a case of degenerative myelitis following spinal anesthesia for a herniotomy. Their patient lived for sixteen months after the operation and developed paralysis of the lower extremities, sphincter involvement, trophic ulcers, and anesthesia from the fifth dorsal dermatome down. At autopsy the meninges over the lower cord were thickened and the posterior half of the lower segments of the cord were necrotic. Maclachlan[12] studied two patients with disseminated encephalomyelitis following stovaine anesthesia. One of these was a woman operated upon for uterine fibroids. She developed flaccid paralysis of all four extremities, double vision, and delirium and after twenty months was still bedridden with paralysis of the right arm and of both legs. Smith[18] observed a case of a previously healthy man who, three years after spinal anesthesia with spinocaine still had weakness and numbness of the right leg, sexual impotence, and rectal incontinence. Examination showed marked patellar clonus, exaggerated deep reflexes, positive Babinski sign on the right, and hypesthesia up to the 9th dorsal dermatome. The cerebrospinal fluid was normal and there was no subarachnoid block. Rieser,[17] Critchley,[4] Light,[10] Pierson,[15] and others have reported lesions of the cauda equina and conus medullaris following spinal anesthesia. We have seen three such cases in the past eighteen months. The symptoms may follow operation for any one of a number of surgical conditions and they consist of urinary and/or fecal incontinence or retention, diminution of sensation in the perirenal region corresponding to the area of distribution of the fourth and fifth sacral nerves, alterations in the knee and ankle jerks, and disappearance of the anal reflex. Cystometrographic studies usually show some loss of tone in the muscles of the bladder but sensation of the interior of the bladder may be intact.

Recently one of us (GRK) saw a case of a twenty-eight year old man who, following the intra-spinal injection of 190 mg. methycaine as spinal anesthetic for the removal of a nonsuppurative appendix, developed a flaccid paralysis of the lower limbs and a sensory loss extending to the twelfth dorsal dermatome. Upon the completion of this paper approximately six months after this patient was first seen, there had not been any change in his neurologic status.

It is apparent, therefore, that though the

From the Division of Nervous and Mental Diseases, University of Minnesota. Presented before the Minnesota Academy of Medicine, February 10, 1942.

nervous system involvement resulting from spinal anesthesia appears to be reversible and hence harmless, there are instances in which irreversible and progressive changes occur. It is to emphasize the potential danger of this form of anesthetic and to describe the severe and extensive alterations that may eventuate that the present case is reported.

Case Report

Mr. O. A., a sixty-six year old white man, was admitted to the hospital on August 5, 1941, because of hematuria of ten days' duration. His past history revealed that he had had an appendectomy in 1907 followed by a stormy convalescence, and typhoid fever in 1916 with uncomplicated recovery. He suffered from habitual constipation. The general physical examination showed no significant abnormalities. The urine was bloody and contained 4+ albumin, no sugar, over 100 red blood count, and 0-2 pus cells. His hemoglobin was 15.3 (92 per cent) and white blood count 6,400. The first spinal anesthetic consisted of 80 mg. of metycaine given in order to facilitate a cysto-urethroscopic examination. Bilateral pyelo-ureterograms were made at the time and were interpreted as normal by the roentgenologist. Recovery from the effects of this anesthetic was apparently satisfactory. The second spinal anesthetic of 240 mg. methycaine dissolved in 4.2 c.c. of water was given one week later, at which time a suprapubic prostatectomy was performed. Microscopic sections of the removed tissue showed a benign hypertrophy of the prostate. The operation was uneventful and patient left the operating room with the usual flaccid paraplegia but otherwise in good condition. On the following day he still was unable to move his legs and examination by the urological resident showed flaccid paraplegia with abolition of all reflexes in the lower extremities. There was hypesthesia from the umbilicus and complete anesthesia to the level of the iliac crests.

The patient was first examined by one of us (GRK) two days after the second spinal anesthetic. At that time the cranial nerves and upper extremities were normal. Lower extremities showed a complete flaccid paraplegia with absent deep and plantar reflexes. There was upward deviation of the umbilicus on contraction of the abdominal recti muscles. Touch and pain sense was impaired from the ninth dorsal to the second lumbar segment bilaterally and all forms of sensation were absent below the third lumbar cord segment. Three days later spinal taps were made at the third, fourth, and fifth lumbar regions. The upper tap brought clear fluid which was slightly yellowish. The middle tap brought xanthochromic fluid which coagulated in a few minutes. The fluid from the lower tap was bloody. Four days later (ten days after the operation) the patient was again examined and now had anesthesia below the first lumbar dermatome on the right, twelfth dorsal on the left and hypesthesia to the ninth dorsal (original level). There was some power of flexion in the toes of the right foot. Spinal punctures were made between the second and third lumbar and between the fifth lumbar and first sacral vertebræ. From the upper needle about 6-8 c.c. of light yellow fluid were obtained with difficulty. Because of the low pressure, manometric readings could not be taken. This fluid contained 237.5 mg. per cent of protein. From the lower needle yellow fluid was also obtained and this was under 3 mm. Hg. pressure. There was no change on jugular compression, but coughing caused a rise or pressure to 6 mm. Hg. The fluid from the second needle contained 325.7 mg. per cent of protein. At this time it was felt that there was a blocking mechanism between the two needles due to arachnoiditis. Treatment consisted of daily intramuscular injections of thiamin chloride and large doses of the other vitamins by mouth. Daily massage and passive motion were carried out and an indwelling catheter was kept in the bladder. Bowel incontinence persisted.

Aside from some return of motion in the left toes and slight return of sensation in the right leg there was very little change in the neurologic status during the next few weeks. Spinal taps were again made three weeks later or one month after the operation. From the upper needle between the second and third lumbar, clear fluid under 8 mm. Hg. pressure was obtained at once. Bilateral jugular compression produced a slow rise to 18 mm. Hg. and upon release the pressure fell more rapidly to 8 mm. Hg. The fluid contained only 57.5 mg. per cent of protein. The fluid from the lower needle between the fifth lumbar and first sacral vertebræ was under 6 mm. Hg. pressure (5 c.c. had been removed from the upper needle). There was a fairly prompt rise to 13 mm. Hg. on jugular compression and rapid return to 8 mm. Hg. on release. This fluid contained 106.5 mg. per cent protein. The fluid from both needles was clear and colorless, cell counts were normal and the Wassermann reaction was negative. It was felt that there had been some decrease in the subarachnoid block and that the patient was suffering from a degenerative condition of the conus and cauda as well as from an arachnoiditis.

During the next six months there was improvement in the neurologic conditions in that some power of motion returned in the right gastrocnemius, right tibialis anticus, and left ileo-psoas. Sensation for pain returned in the entire right lower extremity and touch could be felt at the second lumbar level on the right and pain could be elicited at the second and third lumbar levels on the left. On the evening of March 25, 1942, seven months after the operation, the patient's temperature rose to 99.4° and he complained of chills. On several previous occasions there had been transient fever, presumably due to urinary sepsis. That night he became cyanotic, drowsy, and vomited several times. The following morning he had a convulsion involving the head, arms and upper half of the body. Temperature rose to 105.2° F. axillary. Examination showed the patient to be comatose and not responsive to painful stimuli. The pupils were equal but miotic and not reactive to light. The right eye deviated outward and the right arm was spastic and held in flexion. No reflexes

were obtained. The condition of the lower extremities was flaccid as on previous examinations. The patient gradually failed, temperature rose to 108° F. axillary and death occurred sixteen hours after the convulsion.

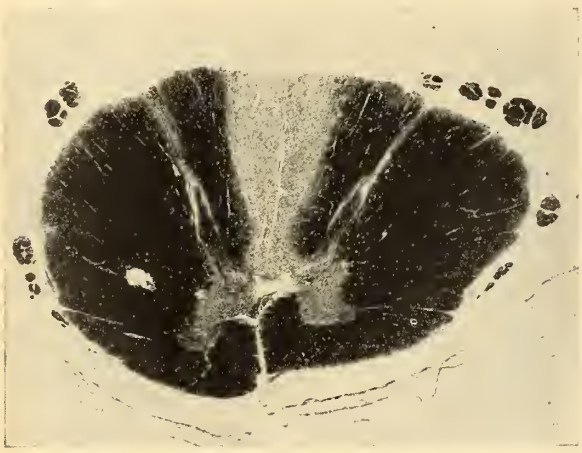


Fig. 1. Section through the thoracic cord showing moderately extensive bilateral destruction of the columns of Goll. Weigert stain.

Autopsy Findings.—A complete autopsy was performed but only the studies made on the nervous system will be presented here. The brain and its meninges were grossly normal and were not studied microscopically.

Upon gross examination the cervical cord was of essentially normal size. In the thoracic levels the meninges were firmly adherent to the cord, particularly in its posterior and anterior aspects. In the upper lumbar regions there was a fine layer of subarachnoid discoloration, probably due to old bleeding. The mid-thoracic levels of the cord were markedly shrunken and were covered with a thin layer of old hemorrhagic discoloration. The meninges were entirely free in the cervical region and around the cauda equina. Cut sections through the thoracic levels of the cord revealed a complete obliteration of the normal architecture. No divisions could be made out between the gray and white matter. The cord substance was extremely soft from the level of the mid-thoracic to the upper lumbar region. The lumbar segments contained numerous petechiæ but the cord architecture appeared to be preserved. The posterior columns in this region presented a whitish discoloration suggesting a tissue necrosis. This posterior column involvement was visible throughout the cord although it tended to decrease in extent and intensity in the higher levels.

Microscopic studies demonstrated a most extensive involvement at almost all levels of the cord, these being most marked in the lower thoracic and lumbar regions. A description of the cord changes can best be approached by a discussion of the alterations seen at each level.

Cervical.—Most of the alterations were limited to the columns of Goll where the myelin sheaths were markedly swollen and the myelin finely granular. In many areas the myelin sheaths had ruptured to form large vacuolated spaces. The axis cylinders were swollen, fragmented and occasionally entirely absent. Numerous dilated vessels were scattered throughout this partially destroyed tissue. Some of the nerve cells, especially of the anterior horns were swollen and partially chromatolytic. Their nuclei, however, were invariably intact.

Upper Thoracic.—The appearance was very similar to that in the levels above, presenting a moderately extensive but incomplete bilateral destruction of column of Goll with no concomitant reaction on the part of either the fat granule cells or glial elements (Fig. 1). The anterior horn cells were moderately swollen. The leptomeninges were thickened and both membranes had fused and appeared somewhat fragmented and homogeneous in structure. This meningeal involvement was much more extensive in the posterior aspects of the cord.

Mid-thoracic.—In this region of the cord the intramedullary changes were similar to those already described except that scattered petechiæ were now present within the gray substance. Some of these bleedings were fairly extensive but did not seem to have disrupted the adjacent cord tissue.

The most striking alterations, however, were not within the cord substance but within the meninges, especially along the posterior and lateral aspects of the cord. Both the subarachnoid and subdural spaces in these regions were replaced by a relatively acellular, fibrous membrane which was composed of interlacing bands of collagenous fibers (Fig. 2). The inner portions of this membrane were loose and reticular in structure and were attached to the thickened pia (Fig. 3). In some areas this membrane had become completely hyalinized. The posterior rootlets were enmeshed within this fibrous tissue but were not compressed or altered structurally. In the anterior aspects of the cord this new membrane became narrowed to a thin band, involving only the arachnoid.

Lower Thoracic.—The meningeal alterations were very similar to those observed in the mid-thoracic cord level. The cord, however, was much more extensively involved. Both posterior columns were partially replaced by a large central area of softening which was round, irregular, but did not extend to the surface of the cord. The center of this softened area was filled with fragmented cord tissue while its periphery was composed of less severely injured elements which had already begun to be invaded by glia. The gray substance was also extensively damaged. Most of the anterior horn cells were shrunken, rounded and appeared homogeneous on staining. Their nuclei were often eccentrically placed or entirely absent. Many of the nerve cells had disappeared or faded out to form ghost cells. Large areas of hemorrhage appeared within the regions of the lateral horns and had produced some destruction of the surrounding tissues. Disrupted and fragmented tissues could be seen adjacent to many of these large hemorrhages.

Upper Lumbar.—The intramedullary changes at this cord level were similar but less extensive than those observed within the lower thoracic regions. The posterior columns were almost completely destroyed with

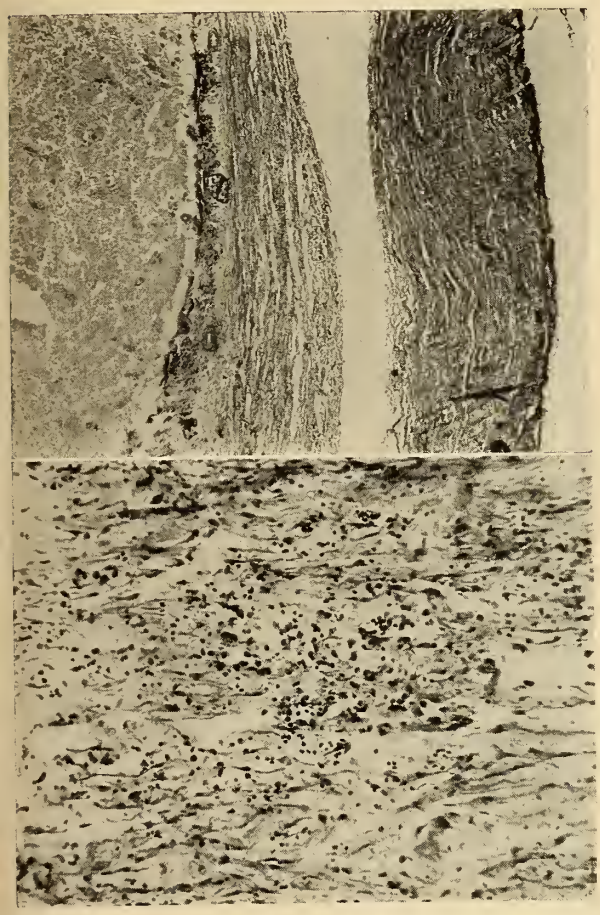


Fig. 2 *(Above)*. Section through the involved meninges and cord. There is marked thickening of all membranes with the complete obliteration of both the subdural and subarachnoid spaces. The space present within these membranes is an artefact. Hematoxylin eosin stain.

Fig. 3 *(Below)*. Higher magnification through the chronic inflammatory membranes. Note that most of the cells are fibroblasts and mononuclears. Hematoxylin eosin stain.

a beginning central cavitation (Fig. 4). No axons or intact myelin sheaths could be observed in this involved area. The posterior column injury at this level had extended laterally on the left side to almost completely destroy the posterior horn and the adjacent structures. Only a few scattered nerve cells could be detected in this region. The remaining areas of white substance appeared structurally intact. The anterior horn cells were swollen and rounded, showing complete chromatolysis. Large petechiæ had produced partial destruction of the gray matter on the right side of the cord.

The meninges on the anterior circumference of the cord appeared intact but the subarachnoid space was filled with a fine, rather loose membrane. In the lateral and posterior aspects the entire subarachnoid and subdural spaces were still completely replaced by a very fibrous, relatively acellular membrane whose meshes were filled with a small group of erythrocytes. No inflammatory elements were visible except for a few scattered mononuclear cells. In the lateral regions this



Fig. 4. The lumbar cord. There is a complete demyelinization of the posterior column. The tissue damage has extended laterally to involve the fasciculus dorsolateralis. Weigert stain.

membrane was partially hyalinized. The rootlets were completely surrounded but were structurally intact. The arachnoid could not be identified and probably became incorporated within the membrane. The pia was markedly thickened, but the dura remained relatively uninvolved.

Lower Lumbar.—Here the destruction to the posterior columns extended to the surface of the cord. The tissue damage appeared to have extended laterally, completely destroying bilaterally the fasciculus dorsolateralis and the substantia gelatinosa of Rolando. Only a few posterior horn cells could be detected scattered among the fragmented injured tissues. Some of the anterior horn cells were swollen and chromatolytic with eccentrically placed nuclei. The meninges were not so extensivly involved. Posteriorly a fine membrane still filled the subarachnoid space and the enmeshed posterior rootlets showed a moderate involvement consisting of a decrease in the number of axons and some swelling and fragmentation of the myelin sheaths.

Sacral.—The involvement at this level was confined to the left posterolateral aspects of the cord where there was a moderate destruction and fragmentation of the tissues. The nerve cells appeared intact. The nerve rootlets for the first time showed most extensive changes. All the posterior rootlets, especially those on the left side, showed almost complete destruction of all their elements, no normal axons or myelin sheaths being present. The entire nerve bundle appeard homogeneous. The anterior rootlets were relatively intact. There was no involvement of the meninges at this cord level.

Discussion

Undoubtedly the changes in the meninges,

nerve roots, and spinal cord described in this case were due to the spinal anesthetic. While the literature contains a fairly large number of reports of the clinical manifestations of damage to the nervous system resulting from spinal anesthesia, it is only through careful histologic study that the nature and the degree of such tissue damage can be evaluated. At the present time a few scattered studies are available describing the cord changes following spinal anesthesia in the experimental animal and in men. About nineteen reports on human material have been published, twelve of these being reported somewhat briefly by Spielmeyer[19] in 1908. In nine of his cases he observed only a mild swelling and chromatolysis of the nerve cells; in the remaining cases the damage was more severe, the cells showing definite nuclear changes with pyknosis and eccentricity of these structures. Similar nerve cell changes were reported by Light[10] and his associates, who studied the spinal cord of a thirty-eight-year-old woman twenty-eight days after spinal anesthesia with novocaine. The nerve cell damage was limited to the lumbar cord in the vicinity of the inoculation. The rootlets and the lumbar segments also showed a mild peripheral demyelinization, although the axons were intact.

Changes within the white substance of the cord were much more frequently described than the nerve cell damage and have been reported by Lindemulder,[11] Brock, et al.,[3] and Nonne and Demme.[14] Lindemulder observed only a peripheral demyelinization in the lower cord segments while Brock, et al., and Nonne and Demme reported much more extensive changes. In the region of the injection the cord appeared soft and showed an extensive demyelinization of most of the fiber tracts. In the higher levels the damage was limited to the posterior aspect of the cord, gradually narrowing eventually to involve only the columns of Goll. The rootlets appeared altered only in the region of the injection of the anesthetic. These changes agree very closely with the intramedullary alterations observed in our case. However, neither of the above authors recorded the meningeal changes present in our case. Such changes, however, have been reported by König[8] and Michelson.[13] In König's patient dying three months after spinal anesthesia (stovaine), there occurred extensive adhesions between the cord and meninges, especially in the lower cord segments. Michelson mentions briefly two cases with adhesive meningitis, producing complete obliterations of the cord spheres. Neither author offers a careful histological description of their lesions.

The lesions produced by spinal anesthesia in the experimental animal resemble fairly closely those described in man. Pitkin,[16] using dogs injected with procaine hydrochloride, observed no definite changes. VanLier[22] and Wossidlo[23] found most of the alterations within the nerve cells of the cord. VanLier injected stovaine into dogs and produced a mild chromatolysis of the nerve cells in those cord segments in the region of the injection. The nerve cell damage was most severe shortly after the injection of the anesthetic and gradually diminished with time so that at twenty-four hours the cells had returned to normal, indicating that these alterations were definitely reversible in nature. Wossidlo used rabbits and studied changes at intervals from one to twenty-four hours after the injection of procaine hydrochloride. He observed a granular degeneration of the Nissl substance and a mild swelling of the cells. Klose and Vogt,[7] using both dogs and rabbits observed similar cellular alterations scattered irregularly throughout the lumbar and dorsal segments. However, with Marchi stains there also appeared white substance damage consisting of peripheral demyelinization with an accentuation of the changes within the posterior columns. Spiller and Leopold[20] also produced degeneration of the posterior columns in dogs killed forty-two days after repeated stovaine spinal anesthesia. Meningeal reactions similar to those reported in the human have been produced in animals only by Davis and his associates.[5] Using nupercaine, spinocaine, gravocaine, and scurocaine injected into the lumbosacral region of dogs, they produced consistently an inflammatory reaction in the arachnoid with a thickening of that membrane and in the more chronic cases, an actual organization of the inflammatory membrane with fibrotic scarring. These meningeal changes were very similar to those reported in our case. These investigators also reported mild ganglion cell changes as well as a mild demyelinization, involving primarily the cord periphery and the dorsal columns.

Conclusion

It is apparent that histologic damage may result to the various cord elements as a result of

spinal anesthesia. It seems that the nature of the anesthetic has no particular influence since damage has resulted with a wide variety of anesthetics. It is very likely that some mild and often reversible changes occur whenever these anesthetics come in contact with the nervous system, but it is only when the changes are irreversible that permanent clinical involvement persists. A careful neurological checkup instituted in every case of spinal anesthesia may very well reveal some of the less striking results upon the nervous tissue. Many nonfatal cases have been reported in which permanent sequels have developed as a result of spinal anesthesia and subsequent cord damage. Since this complication is unpredictable the possibility of its occurrence must be kept in mind whenever a spinal anesthetic is given. The present study describes in detail extensive and permanent damage to the meninges, nerve roots and spinal cord of a man to whom a spinal anesthetic was administered.

References

1. Babcock, W. W.: Spinal anesthesia; an experience of twenty-four years. Am. J. Surg., 5:571-576, (Dec.) 1928.
2. Boisseau: Quoted by Smith.
3. Brock, S., Bell, A., and Davison, C.: Nervous complications following spinal anesthesia. J.A.M.A., 106-441-47, (Feb. 8) 1936.
4. Critchley, M.: Discussion on the neurological sequelæ of spinal anesthesia. Proc. Roy. Soc. Med., 30:1007-12, (June) 1937.
5. Davis, L., Haven, H., Givens, J. H., and Emmett, J.: Effects of spinal anesthetics on the spinal cord and its membranes. J.A.M.A., 97:1781-85, (Dec. 12) 1931.
6. Kamman, G. R.: The use of spinal anesthesia in gastric crises in tabes dorsalis. Minnesota Med., 15:845-8, (Dec.) 1932.
7. Klose, H., and Vogt, H.: Physiologische und anatomische Untersuchungen zur Lumbalanästhesie und zur Frage ihrer klinischen Verwertbarkeit. München. med. Wchnschr., 56: 505-7, (March 9) 1909.
8. König, F.: Bleibende Rückenmarkslähmung nach Lumbalanästhesia. München. med. Wchnschr., 53:1112-13, (June 5) 1906.
9. Koster, H., and Weintrob, M.: Complications of spinal anesthesia. Am. J. Surg., 8:1165-79, (June) 1930.
10. Light, G., Sweet, W. H., Livingstone, H., and Engel, R.: Neurological changes following spinal anesthesia. Surgery, 7:138-156, (Jan.) 1940.
11. Lindemulder, F. C.: Spinal anesthesia; its effect on the central nervous system. J.A.M.A., 99:210-12, (July 10) 1932.
12. Maclachlan, T. K.: Disseminated encephalomyelitis following spinal anesthesia. Brit. M. J., 2:11-12, (July 4) 1931.
13. Michelsen, J.: Spätschädigungen des Rückenmarks nach Lumbal-anästhesie und ihre Verhütung. München. med. Wchnschr., 79:1148-50, (July 15) 1932.
14. Nonne, M., and Demme, H.: Degenerative Myelitis nach Spinalanästhesie. Wien. klin. Wchnschr., 41:1002-5, (July 12) 1928.
15. Peirson, E. L.: Twomey, C. F.: Neurogenic dysfunction of the bladder due to spinal anesthesia. New England J. Med., 223:171-174, (Aug. 1) 1941.
16. Pitkin, G. P.: Controllable spinal anesthesia. Am. J. Surg., 5:537-553, (Dec.) 1928.
17. Rieser, C.: Spinal anesthesia and injury to the nervous mechanism of micturition. J.A.M.A., 117:98-100, (July 12) 1941.
18. Smith, W. A.: Neurologic hazards of spinal anesthesia. J. M. A. Georgia, 22:297-303, (Aug.) 1933.
19. Speilmayer, W.: Veränderungen des Nervensystems nach Stovainanästhesie. München. med. Wchnschr., 55:1629-34, (Aug. 4) 1908.
20. Spiller, W. G., and Leopold, S.: The effect of stovain on the nervous system. J.A.M.A., 54:1840-43, (June 4) 1910.
21. Sullivan, W. M., Jr.: Observations on a patient to whom a spinal was administered five times within thirty-eight hours. J.A.M.A., 99:993-4, (Sept. 17) 1932.
22. van Lier, E. H.: Histologischer Beitrag zur Rückenmarksanästhesie. Beitr. z. klin. Chir., 53:413-19, (March) 1907.
23. Wossidlo, E.: Experimentelle Untersuchungen über Veränderungen der Nissl'chen Granula bei der Lumbalanästhesie. Arch. f. klin. Chir., 86:1017-53, 1908.

MINNESOTA SOLDIERS DISCHARGED FOR MENTAL DISABILITY

ROYAL C. GRAY, M.D., Ph.D.

Minneapolis, Minnesota

FEDERAL legislation[1] was recently enacted whereby any person who has served in the active military or naval service of the United States on or after December 7, 1941 and before the termination of hostilities in the present war, and who is not dishonorably discharged, is granted the same hospitalization and other benefits provided veterans of any war. Previous to thus acquiring the status of a "veteran of any war," hospital care for veterans of World War II was provided, as in the case of peacetime veterans, only if disability was service connected, that is, was contracted in line of duty. Mental disability which occurred within six months from the date of enlistment or induction was considered as indicating it existed prior to entering the service and hence not service connected. Ipso facto a veteran who at any time prior to enlistment or induction had been a patient in a mental hospital, and who was discharged from the service for mental disability, was not afforded federal hospitalization for that disability.

Therefore, it was generally the practice of the post from which a soldier was to be so discharged to request the proper State office (in Minnesota, the Division of Public Institutions) to arrange for his hospitalization. The Division then determined whether or not the soldier had legal settlement in Minnesota and, if so, in what county. When settlement was thus fixed, the post was so informed and authorized to return the soldier to the county seat and deliver him to a designated county offi-

From the Division of Public Institutions, State of Minnesota, Saint Paul, Minnesota.

TABLE I. MINNESOTA SOLDIERS DISCHARGED FOR MENTAL DISABILITY

		Committed to State Hospital	Commitment not necessary
Discharged to county	87	44	43
Discharged to relative	24	4	20
Discharged to own custody	1	0	1
Totals	112	48	64

cial. The post was requested to transmit with the soldier a clinical history of the case. Transportation for the soldier and any necessary attendants was at government expense.

If in the opinion of the county officials the soldier should be placed in a state hospital a Probate Court hearing was held and if he was adjudicated insane a dual commitment was made to the state hospital and to a federal hospital (in Minnesota, the Veterans' Administration Facility, St. Cloud, Minnesota). Thus, if it later developed he was entitled to care in the latter, no further legal proceedings would be necessary and he could be transferred to the federal hospital forthwith. The cost of the Probate Court hearing and the transportation of the patient to the state hospital are borne by the county of settlement and the cost of the hospital care by the State.

State Hospitalization of Discharged Soldiers

During the twenty-one month period between July 1, 1941 and April 1, 1943, requests were made of the Division of Public Institutions to accept 122 veterans of World War II for hospitalization. The dates of their entering the service were in the twenty-one month period between January 1, 1941 and October 1, 1942. Ten of these requests were denied as the veterans concerned did not have settlement in Minnesota. One hundred and twelve veterans were accepted (see Table 1) and eighty-seven were returned from their posts to designated counties.

Of these 112 Minnesota soldiers, twenty-two were from Hennepin county, eighteen from St. Louis, fourteen from Ramsey, three each from Beltrami and Rice, two each from Aitkin, Becker, Cass, Houston, Isanti, Olmsted, Pennington, Pine, Polk, Wabasha, Winona, and Wright, and one each from twenty-eight other counties. That is, fifty-four (48 per cent) were from the three urban counties and fifty-eight (52 per cent) were from fourteen of Minnesota's eighty-four rural counties. The population of Minnesota is approximately three million, with one million urban and two million rural. Thus the ratio of mentally disabled soldiers in this series, urban to rural, is about two to one.

At the same time as the Army post made inquiry of the State office, the nearest of kin of the soldier was informed by letter that the soldier had a mental disease, his discharge from the military service was necessary, and his transfer to a non-military hospital for the care of mental patients was recommended. The relative of the mentally disabled soldier was allowed to assume his custody by signing a notarized agreement stating his willingness and ability to do so and returning the same to the Army post. The soldier was then discharged directly to the relative or delivered to his home at government expense. Twenty-four of the 112 Minnesota soldiers were thus discharged or returned to their relatives and one was discharged to his own custody.

Forty-eight of the 112 Minnesota soldiers discharged for mental disability were adjudicated insane at Probate Court hearings and became patients in the four state hospitals. Of these forty-eight, four had been discharged or returned to relatives who subsequently found themselves unable to provide personal or private care for them, and forty-four had been returned to the designated county officials for state hospitalization. Probate Court hearings were not held or were not necessary in the cases of the other twenty soldiers discharged or returned to their relatives, the one discharged to his own custody, and the other forty-three returned to the counties. Evidently these 64 soldiers made a satisfactory adjustment in the home and community.

Diagnoses of the Soldiers' Mental Disability

Table II lists the Army diagnoses of the 112 soldiers discharged for mental disability and shows 71 per cent of the discharges were incident to dementia praecox (schizophrenia). The table also shows the Army diagnoses of the 48 who were committed to the state hospitals and the diagnoses made by the hospitals' staffs. The table does not indicate the differences in diagnoses of individual cases. However, excluding the Army diagnoses of dementia praecox unclassified and psychosis unclassified, which cases the hospitals'

staffs placed in definite categories, there was a very close accord in clinical concepts. In fact, there were only six instances of disagreement, one case having an Army diagnosis of dementia praecox catalogued by the hospitals' staffs as psychoneurosis anxiety type, one dementia praecox as manic-depressive psychosis depressed type, and four affective psychoses as dementia praecox.

TABLE II. DIAGNOSES OF SOLDIERS' MENTAL DISABILITY

	Army discharge diagnosis	Committed to State Hospital	State Hospital diagnosis
Dementia praecox, simple type	12	4	5
Dementia praecox, hebephrenic type	17	5	13
Dementia praecox, catatonic type	9	8	11
Dementia praecox, paranoid type	22	8	8
Dementia praecox, mixed type	7	3	1
Dementia praecox, unclassified	13	5	0
Manic-depressive psychosis, manic type	4	3	2
Manic-depressive psychosis, depressed type	6	3	4
Psychosis, unclassified	11	7	0
Psychosis with mental deficiency	6	2	3
Depression	1		
Agitated depression	1		
Korsakoff's psychosis	1		
Paresis	1		
Psychosis with psychopathic personality	1		
Psychoneurosis, anxiety type			1
Totals	112	48	48

Duration of State Hospitalization

As of May 1, 1943, of the 48 soldiers who were committed to the state hospitals 11 had been released on parole after periods of hospitalization ranging from 42 days to 234 days with an average of 141 days. Three of the 11 had state hospital diagnoses of dementia praecox catatonic type, two hebephrenic type, and one each simple type, paranoid type, manic-depressive psychosis manic type, depressed type, psychosis with mental deficiency, and psychoneurosis anxiety type. One of the 11, whose diagnosis was dementia praecox hebephrenic type, and who had 42 days residence in a state hospital, died while on parole.

One died of acute bronchitis after 107 days in a state hospital. One escaped after 138 days. Four were transferred to the Veterans' Administration Facility at St. Cloud, Minnesota, after an average state hospital residence of 146 days and one was transferred from a state hospital to a private sanatorium after thirty-eight days.

Thirty of the forty-eight soldiers remained patients in the state hospitals. Their individual periods of hospitalization ranged from forty days to 490 days with an average of 146 days.

Expense Involved

The cost to the State for the hospitalization of the forty-eight veterans of World War II, computed on the basis of an average annual net per capita cost of $240 per patient in the four state hospitals, has been approximately $4,500. This sum will be increased by the further length of stay of the 30 soldiers still remaining hospitalized. The cost to the counties for commitment and transportation of the patients to the state hospitals has been about $1,500.

These veterans were only those discharged by the Army and notice of whose discharge had come to the Division of Public Institutions. Notice was not a routine procedure by all posts. Also, a soldier might be discharged from the Army as feebleminded, psychoneurotic, or psychopathic and, in due course, as a civilian come to a commitment as insane. The Navy and Marine Corps, it seems, without notice to the State office, discharged the mentally disabled veteran directly to his nearest relative who, in turn, might find it necessary to commit him to a state hospital.

Estimates of the cost to the Federal Government for the induction, training, and return to his home of a soldier who becomes disabled within six months, range from $500 to $1,500. On that basis the federal outlay for these 112 mentally disabled soldiers returned to Minnesota was approximately $100,000. Incidentally, these soldiers were returned from widely scattered posts within the United States, one from Alaska, and

one from the Canal Zone. None of the 112 soldiers had been in a combat zone.

The above noted costs are only the initial and lesser ones. Extended periods of hospitalization and disability benefits may be added and amount to several thousand dollars in individual cases. Moreover, all this time the affected soldier is nonproductive and a social as well as an economic liability.

Previous Mental Disease in the Soldier and His Family

The names of the 112 returned soldiers were cleared through Central Index, the state bureau of social agency registrations, to ascertain any previous commitments for insanity affecting the soldier, his parents, or siblings. The Index had such registrations on thirty-two of these soldiers or their families.

Fourteen of the soldiers had been patients in Minnesota state hospitals, of whom, at the time of entering the service, three were on escape, two were on parole, and nine had been discharged from a state hospital. The escapes and paroles were returned to the respective state hospitals and four of the nine discharged former patients were recommitted to a state hospital. In addition to the individual registrations for these fourteen, seven of them also had one parent and/or one to three siblings who were or had been state hospital patients.

Eighteen other soldiers had one parent and/or one sibling who were or had been patients in Minnesota state hospitals. Twelve of these eighteen with a family history of mental disease were committed upon return to their counties of settlement.

Four of the forty-eight veterans who were committed to state hospitals had been patients in private psychiatric hospitals in Minnesota prior to their Army service. There were no Central Index registrations for these private hospitalizations.

Discontinuance of State Hospitalization Requests

Federal hospitalization[1] having now been authorized, since April 1, 1943, the Army has made no requests of the Division of Public Institutions for state hospital care for World War II veterans. The soldier's nearest of kin is notified that he has a mental condition and therefore his discharge from the military service is necessary, that further hospitalization is required, and that he is eligible for such medical care in a Veterans' Administration Facility. The relative may elect to place the soldier in a hospital of his choice at his own expense. If he decides to provide such hospitalization he must sign a notarized agreement stating he is willing to assume responsibility for and control over the soldier upon the latter's discharge from the Army, that he is financially able to assure the soldier such care as may become necessary, and will place him in a reputable institution for care and treatment. If the relative does not wish to assume responsibility for the soldier or provide hospitalization the Army then requests the Veterans' Administration to designate a facility to receive him. If the relative does decide to provide care and hospitalization the soldier is transported at government expense to the former's home.

Screening Program

A method devised by Stone[2] for screening Selective Service registrants, utilizing the volunteer services of social workers from various agencies, has been functioning in St. Paul and Ramsey county. This procedure was recently inaugurated in Minneapolis and Hennepin county and in Duluth. Plans are in process to institute a statewide screening program superintended by the State in coöperation with Selective Service Headquarters.

The medical files in the Division of Public Institutions are privileged communications and therefore, as it is, the screening committee does not have access to the material. Clearance of individuals through Central Index before their entrance into the service and subsequent reference to the medical files in the Division of Public Institutions, under proper authority, would disclose to the military medical examiners those cases of mental disease in the individual or his family. Data presented in this paper do not have a control series. However, it appears that by this procedure alone, albeit not so inclusive as the screening program, a fair number of persons already having or destined to have mental disease would be identified and withheld from entering the service, thus effecting a considerable individual and governmental saving.

Summary

1. An account is given of 112 Minnesota veterans of World War II who have been discharged

from the Army for mental disability, forty-eight of whom required state hospital care. Nine of these forty-eight had themselves previously been patients in a state hospital and an additional twelve had immediate family members who were patients in a state hospital.

2. The past and current procedures for the mentally disabled soldier's discharge and provisions for his hospitalization are outlined.

3. Schizophrenic reaction types were the diagnoses in 80 per cent of these disabilities.

4. The recovery rate in general has been somewhat more favorable than the ordinary experience in similar mental ailments.

5. Since about four of every 1,000 soldiers are being discharged for psychiatric reasons screening aids are in order. As one, clearance through Central Index and the Division of Public Institutions, under proper authority, prior to the individual's enlistment or induction is recommended.

References

1. Public Law 10: 78th Congress, Chapter 16, 1st Session, H.R. 1749, approved March 17, 1943.
2. Stone, A.: Screening of selective service registrants. The Compass, 24:13-15, (Apr.) 1943.

THE INFLUENCE OF WAR ON MEDICINE

BOWMAN C. CROWELL, M.D.

Associate Director, American College of Surgeons

Chicago, Illinois

A RECENT more or less superficial perusal of the endless accounts of war diseases and war injuries from pre-Biblical times to the present makes one wonder why the world had to wait so long for Sherman's oft-quoted epigram about war.

The wars of history caused untold suffering. The conditions under which the fighting men lived, in crowded barracks, without sanitation, and many times poorly fed and clothed, furnished the optimum media for the occurrence, propagation and dissemination of diseases. It is not possible for one to give a description of them which is accurate in the light of our present state of knowledge, but through all of the descriptions of the wars in Biblical times, up to and during the Crusades, and the numerous European, Asiatic and African wars until the time of our own Revolution, there runs a monotonous repetition of accounts of leprosy, smallpox, scurvy, typhoid, typhus, scabies, syphilis, meningitis, measles, influenza, plague, cholera, and the dysenteries.

These diseases were not all accurately described, but from the writings about them we are justified now in so classifying them. Doubtless many other diseases existed which have since died out. Rags, filth, famine and ignorance have made the wars incalculably greater risks from disease than from weapons. Suppuration of wounds was, of course, the order of the day and was expected.

Prior to our Revolutionary War, the science, or art, of medicine had not progressed to a stage in which it was susceptible to benefit from war experiences. True, lazarettos for segregation of lepers had come into existence during the Crusades, ambulances had been introduced by Larrey, and the navies had learned something of scurvy and its prevention. The names of such men as Paré, Hunter, and Larrey stand out above the medical men of their times because they were able to benefit from their war experiences. To medical students and physicians it would be superfluous to describe the contributions which these men made to medicine and surgery, but they were exceptional, and their accomplishments attract attention in history chiefly as feeble lights in a surrounding night of ignorance.

This same condition existed even during our own Revolutionary War, when communicable diseases, poor sanitation and famine made the actual history of the war much less heroic, or perhaps more heroic, according to one's viewpoint, than can be gathered from lay descriptions of events. Here, perhaps, yellow fever and malaria play an even more important part than they had previously.

Our war of 1812 gives very little change in the medical picture. In the Mexican War, just one hundred years ago, one in each three sol-

Read before the joint meeting of the Minneapolis Chapter of the American College of Surgeons and the Minneapolis Surgical Society, May 6, 1943.

diers was lost to the Army through disease, and seven men died from disease to one who was killed or who died of wounds. The details make about as depressing reading as can be found.

So, speaking in general terms, up to the time of our Civil War, a paper with the title of my present one could scarcely be written. Anesthesia had been introduced in 1846, but antisepsis or asepsis was still unknown. However, a more scientific attitude toward the medical care of soldiers was becoming obvious. It was in 1862 that the Army Medical Museum was established, which is one indication of a more scientific attitude, but with about a million men continuously under arms in defense of the national flag, about 200,000 of them still died of disease and about 100,000 of wounds.

As far as I can determine, the investigations of injuries to nerves by gunshot by S. Weir Mitchell, George R. Morehouse and William W. Keen were the outstanding surgical contributions, which have since become classical, of the Civil War period. The Museum at the Jefferson Medical School still contains much of the material on which their studies were based. The effects of projectiles on human tissues were accurately studied for the first time. Therefore, it would seem that our Civil War, or War of the Rebellion, was the first in history in which notable contributions to surgical progress were made, and the results are perpetuated in the Army Medical Museum and library. The origin of these institutions should not be mentioned without reference to Surgeon J. S. Billings, who did so much to foster them. Hygiene also commenced to receive serious consideration at this time.

The next enemy with which we had to deal was Spain. Our war with the Spaniards introduced us to tropical medicine. While the toll from disease was terrific, the war led to our occupation of Cuba, Puerto Rico and the Philippines. This was followed by the work of the Walter Reed Commission on yellow fever which made possible Gorgas' elimination of yellow fever and malaria from Havana and Panama. Gorgas' work was paralleled by that of Oswaldo Cruz in Rio de Janeiro. Ashford's work on hookworm in Puerto Rico and that of Stiles in our southern states were almost equally important.

Our occupation of the Philippines led to the establishment of medical organizations and institutions, the importance of which, in my opinion, has never been sufficiently recognized. First under military régime, and then under civil administration, an unparalleled program of sanitation and health education was undertaken and enforced. Modern hospitals, a modern medical school, and a modern medical research bureau were established, and from them the medical profession of the United States became conscious of the problems of tropical medicine and learned how to control many diseases. The literature emanating from the Bureau of Science, from the Bureau of Health, and from the University of the Philippines constitutes a real epic in the control of smallpox, cholera, bubonic plague, beriberi, leprosy, malaria, the dysenteries and other intestinal diseases.

An important chapter in American medical history is contained in the last sentence. The names of Worcester, Freer, Heiser, Strong, Musgrave, Teague, Barber, Walker, Wooley, along with those of the members of the U. S. Army Commission for the Study of Tropical Diseases as they exist in the Philippines, including Nichols, Ashburn, Vedder, Whitmore, Chamberlain, Craig and Munson merit a permanent place in the annals of tropical medicine. Stitt, Butler, *et al,* of the U. S. Navy, also deserve special mention.

This seems to be an appropriate place to discuss briefly what tropical medicine really is. Naturally it is the study of diseases as they exist in the tropics. Practically all diseases of temperate climates are found in tropical regions. The climatic conditions favor prolific growth of animal and vegetable life. The animal life, important from the medical standpoint, includes all forms from the protozoa up to and including the insects. Animal parasites assume an importance much greater than in temperate zones, and a knowledge of parasitology is of paramount importance to those engaged in tropical medicine. It is just as important as a knowledge of bacteriology. The fact that so many insects are vectors of disease and function as intermediary hosts in the life cycle of so many of the parasites makes a familiarity with them essential.

Coupled with the effects of climate, I would say the effects of animal parasites on the human body account for the chief difference between the practice of medicine in the tropics and in temperate climates. This fact has an important

bearing on our medical education today. Our military services are sending men and women into the tropics where special care must be taken to avoid these parasitic diseases. Despite this care, some will contract the diseases and will return with them to this country where they must be recognized and treated.

Carriers of diseases, who have either suffered from a disease or become hosts to the parasites from which they themselves do not suffer, constitute a serious menace to those with whom they come in contact. The remarkable shortening in the time of transportation brought about by the use of the airplane makes it possible for individuals to pass from the tropics to temperate climates during the incubation period of disease, which does not manifest itself before leaving the tropics, and infected insects or small animals may find a ready hiding place in the airplanes and infect both animals and men in temperate climates unless they are detected and destroyed.

The parasites of most importance from the standpoint of human disease are included within the classes of the protozoa and the helminths, so familiarity with protozoology and helminthology is an essential part of the armamentarium of the physician in the tropical world. It is assuming an almost equal importance for physicians in temperate climates in order that they may be able to recognize and treat cases returning to this country. The practitioner and the pathologist must be constantly on the lookout for imported diseases. To the examinations of the clinical pathologists particularly there comes an added importance. Parasites of different kinds may be found in the blood, in the urine, in the feces, and other body fluids, and in no phase of medical practice is the aid of the clinical pathologist of greater advantage to the clinician.

Without any attempt to enumerate the diseases to which I have reference, I would draw especial attention to malaria, filariasis, schistosomiasis, and leishmaniasis.

In view of subsequent world events, America's war with Spain seems to have played an important part in the evolution of American medical practice by giving the doctor a greater familiarity with the medical problems which he is being called upon to solve during the present global war.

Now let us turn to the next war in which the United States was involved—the first World War—and see what it has done for American medicine. On a large scale it proved the efficacy of preventive medicine as exemplified by the application of the principles of immunization. Typhoid and paratyphoid fevers were practically eliminated as war hazards. The method of control of typhus was definitely learned and surgery received an enormous impetus. It is not easy to appreciate the relative value of experiences in the different fields of medicine as a result of single events, but it would seem to me that while the Spanish-American War led chiefly to a broadening of our medical knowledge, the first World War's chief contribution to medicine was through surgery. The treatment of wounds of soft parts and of fractures attracted more serious attention than ever before, with more beneficial results attainable as more experience was gained.

Thoracic surgery may be said to have been born during the last World War, and it has been carefully nurtured ever since, until surgical procedures upon the organs within the thorax that were undreamed of a quarter of a century ago are now routine daily procedures in our larger clinics. Neurosurgery, including the surgery of the central nervous system as well as of the peripheral nerves, also profited greatly from the experiences of the first World War.

As I represent a surgical organization, it would not be fitting for me to pass over the first World War without a reference to the part played in it by the American College of Surgeons and the war's effect upon that organization. The American College of Surgeons was organized in 1913. Upon our entry into that war the Director General of the College, Dr. Franklin H. Martin, was appointed by the President as Chairman of the Medical Board of the Council of National Defense and the Medical Section of the Advisory Commission. Ninety per cent of the Fellows of the American College of Surgeons enlisted for war service; forty per cent in the Medical Corps of the United States and Canadian armies, ten per cent in the Navy Medical Corps, and forty per cent in the Volunteer Medical Service Corps of the United States. Fellows of the College headed the greater percentage of the forty-two base hospitals organized for service overseas. Many of these were composed of surgeons and other medical and nursing personnel from one institution, and many of the enlisted men were drawn from the undergraduate body of an affil-

iated university. The idea for such a unit emanated from Dr. George Crile, then a vice president of the College. An important lesson in cooperative effort was learned, and after the war a number of committees of Fellows of the College were established to continue this coöperation.

I shall refer especially to one committee which was formed by a group of surgeons returning from the war who had become impressed with the desirability and possibility of applying to fractures in this country the principles of treatment which they had learned in Europe. A Fracture Committee of the College resulted and it still exists with nearly a hundred subsidiary regional committees throughout the country to carry out the policies determined by that Committee, all of which are for the purpose of improving the treatment of fractures.

In the interval between the last World War and the present one, American medicine and surgery made great strides, so that at the present time I think it cannot be disputed that world leadership in the medical profession is in the hands of the Americans. Impoverishment of European schools may have some bearing on this. It is a little difficult to single out individual fields in which the greatest advance has been made in the last twenty years, but certainly one should include our increased knowledge of dietetics, including the vitamins; the advances in chemotherapy, including the sulfonamide compounds; the study of the chemistry of the body, including water balance; the studies of wound healing; the treatment of burns; plastic procedures; and the preparation of the patient for operation so as to eliminate, or minimize, shock and the many other complications that so frequently followed more primitive surgery. In this field should be included, of course, our knowledge of the blood and its various constituents, and substitutes, which are used in transfusion with inestimable benefit to the patient. The development of a method of immunization against yellow fever should also be noted. Life at great heights and at great speed in the airplane, and at great depths in the submarine, has introduced problems which have taxed the ingenuity of the physiologist and the engineer. Due acknowledgment should be made of the invaluable contributions of the radiologist which have been made since the last war.

During this interval there has been another extremely significant advance in American medicine and surgery brought about by the better preparation for practice as the result of elevation of the standards through the influence of the American College of Surgeons, the American College of Physicians, and the numerous American Boards of the specialties. Fellowship in the Colleges and certificates from the American Boards are more widely sought by members of the profession than recognition of this type has ever been wanted before, and they have great value in that they are granted only after evidence is presented of training and experience such as has never before been possible to large groups of men. To make possible the fulfillment of these requirements of the Colleges and the Boards it was necessary to increase greatly educational facilities.

On account of the large amount of information concerning the facilities of individual hospitals throughout the country which had been accumulated as the result of personal surveys made by representatives of the College in the course of its program of hospital standardization, it was logical that the American College of Surgeons should undertake the task of conferring with the hospitals, to the end that greater facilities for graduate training in surgery should become available. The hospitals which were not fully utilizing their teaching facilities have been encouraged to do so, and now a sufficient number of hospitals are conducting graduate training programs in surgery to fulfill the requirements of the country for competent surgeons.

With the entrance of the United States into the second World War, the medical profession was in a better position than ever before to cooperate with the military branches of the Government and to furnish to them a qualified medical personnel. The American Medical Association compiled a complete roster of the members of the medical profession and by the aid of local committees evaluated the abilities of the individual members, so that they might be placed where their peculiar training and experience would make them of the greatest service. This information accumulated by the American Medical Association was placed freely at the disposal of various government agencies. The American Medical Association has also made an invaluable contribution through its numerous publications in carrying information to the medical profession

concerning the innumerable problems of medical-military organization and of military medicine.

The American Medical Association, the American Hospital Association, and the American College of Surgeons have placed information concerning the physical facilities and the medical, nursing and technical personnel of hospitals at the disposition of the appropriate government services, so that the hospitals might render the greatest aid to the armed forces and for the purpose of civilian defense. Of course, this has thrown a great burden on the medical profession and the hospitals, as with depleted staffs they are called upon not only to perform the added tasks called for by the armed forces and organized civilian defense, but also to continue to give the best medical and surgical care possible to the general civilian population.

The National Research Council has appointed many medical and surgical committees which have been conducting research along lines which will be of especial use in the efficient medical care of soldiers and sailors. Already several manuals have been published by these committees for the guidance of those in military medical service.

The medical schools of the country, also with depleted staffs, have done a noble job in carrying on their educational work, and in speeding it up, for their regular undergraduate students and for groups already assigned to the armed medical services. This is a subject of such common knowledge that I do not feel called upon to elaborate upon it, but could not omit mentioning it and paying tribute to it in a discussion of the relations of the medical profession and the war. As in the last war, many medical schools and larger hospitals have formed special units which have been placed at the disposition of the Surgeons General of the Army and the Navy.

Previously in this paper I have mentioned some contributions war has made to the medical profession. I have referred to the advances which have occurred in medicine and in surgery, and to our introduction to tropical medicine. The present war still further broadens the horizon of the American medical profession and we must now think in terms of Global Medicine rather than American medicine, tropical medicine, or any other restricted phase of professional work. Our armed forces are going to all parts of the globe where new and hitherto unfamiliar diseases and living conditions are being found. These must be dealt with on the spot and the members of the profession who do not leave our shores must be in a position to recognize and to treat conditions in those who return which they have not before personally encountered. This condition inevitably is going to require readjustments in the medical curriculum of the teaching centers and it will place an added educational burden upon an already overloaded program.

Wendell Willkie in "One World" says: "Though we began to grow up with the earlier World War, we are only now changing completely from a young nation of domestic concerns to an adult nation of international interests and world outlook."

The American medical profession has always met its challenges and I have every confidence that it will meet this one.

THIAMIN CHLORIDE—AN AID IN THE SOLUTION OF THE MOSQUITO PROBLEM

W. RAY SHANNON, M.D.

Saint Paul, Minnesota

THE health hazard, to say nothing of the annoyance of the bite of the mosquito, is too universally recognized to need reëmphasis. So it would seem superfluous to argue the advantages of any agent by which its malevolence could be reduced. It is the purpose of this paper to report and discuss results obtained in combatting the mosquito pest by the internal administration of large doses of thiamin chloride.

A previous paper dealing with the use of this agent in the relief of itching conditions in infants and children (1) had been finished and presented for publication shortly before the mosquito season for 1942 came on. It was natural, therefore,

to try to control the itching of mosquito bites with Vitamin B_1. The results at the very beginning were dramatic, and later observations were sufficiently favorable to warrant a preliminary report at this time.

Case Reports

Case 1.—A boy, two years of age, was seen because his mother said he had to be kept inside the house all of the time because of the viciousness with which mosquitoes attacked him whenever he got outside. Once bitten, he had lesions lasting for days, he scratched constantly, even his sleep being seriously disturbed. I found him to be literally covered with welts and excoriations, many of which were new and others obviously days old. Large oral doses of thiamin chloride were prescribed.

The mother's later report stated that on the first day she had given him 40 mg. of thiamin chloride and he slept all night without scratching. The next day he was given three doses of 20 mg. each. He did receive mosquito bites but they did not cause him to scratch, and even the excoriations of previous days did not seem to come to his consciousness. By evening all welts, not only those of the new bites but also those of days before, had disappeared and the patient had ceased to scratch altogether. Excoriations, of course, remained.

Case 2.—A girl, five years of age, had been obliged to stay indoors every summer of her life because of mosquitoes which attacked her violently on every exposure and poisoned her so that the lesions swelled to tremendous proportions and lasted for days. Her appearance at my office bore out the mother's statements.

I injected 35 mg. of thiamin chloride subcutaneously and prescribed 20 mg. more for the first day. This dose was to be repeated each day thereafter, but when the patient became apparently impervious to the insects it was gradually cut to 5 mg. per day.

According to the mother all itching ceased shortly after the injection was given at the office. The following day the patient was entirely comfortable though she did receive a few bites, but after this time the mosquitoes did not even approach her. A daily dose of 5 mg. gave her complete protection for the rest of the summer.

Case 3.—An adult female had been quite unable to get out into her yard at night because of the mosquitoes. As in the other cases they seemed to flock around her, bit ferociously, and poisoned her greatly. She was given 120 mg. during her working day at the office. That evening she worked until dark in her garden without a single bite. By taking large though unrecorded doses she kept herself impervious to mosquitoes during the rest of the summer.

This year, when the mosquitoes began to bother her, she took 80 mg. per day for one week and then reduced the dosage to 10 mg. per day. Mosquitoes did not approach her, and she neglected to take thiamin altogether for two or three days. At this time they began again to pester her so she started the next day to take 80 mg. per day and has not been bothered since.

Case 4.—An adult female had been so bothered by mosquitoes all her life that she was unable to expose herself to them at all without suffering the tortures of their bites for days and nights thereafter. She took 40 mg. on the evening of the first day, 80 mg. the next day and went out into her garden that evening. Not a mosquito approached her and two days later she still had not been bitten though she had worked in her garden and yard and had had abundant exposure to the insects. The last two days she had taken 10 mg. per day.

Case 5.—A boy, fifteen months of age, was very badly poisoned by mosquitoes. He was given 20 mg. of thiamin chloride every four hours the first day, probably receiving 3 doses, and 10 mg. daily thereafter. One month later the mother reported that he had received only a few bites during that time and those he did get had not bothered him nor had they persisted.

Case 6.—A girl, four years of age, was brought to the office because of numerous mosquito bites which had been present for days and which she had scratched vigorously enough to cause many excoriations. My record contains the notation that while many obvious mosquito bites were present, new and old, some lesions were of a different character. She was given 80 mg. of thiamin that day and 20 mg. per day thereafter. When the mother returned with the child one week later she said that the mosquitoes no longer bothered. Lesions of scabies did, however, remain and were given their specific treatment.

Case 7.—Baby boy, 8½ months of age, was found to be covered with mosquito bites during a routine examination. He was given 80 mg. of thiamin the first day and 20 mg. daily thereafter. Two months later the mother reported that the bites had cleared almost at once and that no evidence of the mosquito pest had been noted since.

Case 8.—Girl, seven years old, was unable to swim in the lake at which she lived because of the mosquitoes. She had numerous lesions typical of mosquito bites on her exposed areas. She was given 80 mg. of thiamin chloride that day and 10 mg. daily thereafter. Two months later the mother reported that the patient had been swimming every day without any trouble from mosquitoes.

Case 9.—A boy, eighteen months of age, was found on physical examination to be suffering from an acute upper respiratory infection. His skin, however, presented the appearance so characteristic of the mosquito-sensitive infant, old and new welts interspersed with old and new abrasions due to incessant scratching. He was given 40 mg. of thiamin chloride that day and the next. Four days later the mother reported that

the welts had disappeared almost at once and that while the mosquitoes had been abundant, they had not approached the patient. I advised the continuance of thiamin, 20 mg. per day for two days and then 10 mg. per day. This was continued with complete success for the rest of the summer.

Case 10.—An adult male, preparatory to a trout-fishing trip (a frequent indulgence to which his greatest obstacle was the mosquito problem) took orally 40 mg. of thiamin chloride before going to bed, 40 mg. on leaving home at 4:30 a.m., and another 40 mg. at noon following. He fished all day, along with the other members of his party, and mosquitoes were very numerous. The others were bitten ferociously and were covered with welts on all accessible surfaces. He was annoyed, as always, by the swarms of insects about his head, but sustained only a few bites, none of which was bothersome, and returned home bearing not a single lesion.

Discussion

If there were any purpose, many more cases could be included but all phases of the problem that I know are adequately illustrated here. That knowledge can be summed up in three facts which emerge after one considers the group carefully. First, thiamin chloride administered either by injection or by mouth is capable, in adequate dosage, of causing previously susceptible persons to become not only tolerant but actually repellent to mosquitoes; second, it is capable of minimizing or completely eliminating the itching from bites either recent or old; third, it is capable of affecting the papules that mosquito bites habitually cause in such a way as to both prevent (or minimize) immediate reactions and cause the rapid recession of lesions of long standing.

The questions that these facts bring up are more numerous and include such uncertainties as that of proper dosage; what is the mechanism by which the thiamin acts; does it work in all individuals; is it effective against all species of mosquitoes, and what is the health value of this method of treatment.

The last question, most important of all, is least answerable. The final estimate of the importance of the whole procedure will depend upon the solutions of the problems which make its answer possible. Obviously, to have a health value, it must affect disease-carrying mosquitoes, and whether it does or not is not known. Then too, complete protection of human beings demands complete protection against the bite in all individuals. For many this has not been the experience, even though the number and effects of the bites have been greatly reduced.

The mechanism of action is also without explanation at this time. Some patients have observed that there is a characteristic odor, typical of thiamin chloride, which emanates from the skin of persons receiving large doses of the vitamin. This might cause mosquitoes to avoid such persons and one could suspect this to be important when one watches mosquitoes approach heavily-dosed individuals, hover around them, perhaps alight temporarily in several places, and finally fly away. On the other hand one person was induced to apply an ointment containing three per cent of thiamin chloride on uncovered surfaces and then deliberately expose herself to the insects. She was not protected even though the odor was sufficiently prominent to cause her friends to avoid her. Furthermore it would be impossible to give more than partial credit to such a mode of action since such profound effects on itching and welts, even welts of long duration, could hardly result from a cast-off smell.

Even the question of required dosage is uncertain. Blood concentration determinations could do much to eliminate this, but, lacking these in the present study, the handicap was sidestepped by the simple expedient of trial and error. This method has shown that for rapid results initial dosage should be large, even fantastic in terms of the accepted normal daily requirements of this vitamin. It is presumed that the large initial dosage brings about a rapid saturation of the tissues and that quick therapeutic results are dependent upon that fact. By prescribing the vitamin in doses of 40 mg. every four hours until relief it has been possible to arrive at the rough conclusion that from 80 to 120 mg. the first twenty-four hours will produce satisfactory results in almost every person before the second day arrives. As a matter of fact the period before results are noticed is frequently but a few hours and this fact gives the treatment a practical value which is so well illustrated in Case 10. Here the patient deliberately protected himself against an anticipated temporary exposure to mosquitoes, in this case a fishing trip, by loading up on the vitamin before and during the event. The possibilities for the extension of this type of application to practical problems and situations are too numerous to mention. This is especially

applicable to those individuals whose possible exposure to the insects is periodic and anticipatory.

Beyond this point I have not been able to conclude anything. As an example of the variabilities I might compare Cases 1 and 2. In the former, an infant of two years, the initial dosage of 100 mg. in the first twenty-four hours was entirely satisfactory and it resulted in a tremendous change for the better. However, the mother reported later that in order to keep her son adequately protected she had to give from 60 to 80 mg. per day. Her final reaction was to decide to keep him indoors. Case 2, on the other hand, was able to roam the countryside on 5 mg. per day after the initial saturation. Still others, adults, have been protected on 10 mg. daily after the large initial doses. Certain observations have caused me to wonder if excessive perspiration might not be one of the determining elements in the uncertainty of individual requirement.

Conclusions

Thiamin chloride in adequate dosage, administered either by mouth or by injection, is capable of reducing the mosquito hazard as it applies to human beings in at least three ways: first, it diminishes, may altogether eliminate, the approach of the mosquito toward the protected individual; second, it lessens and may entirely combat the itching that usually follows the bite; third, it minimizes and often entirely prevents the formation of a papule at the site of the bite. Indeed it causes a rapid recession of welts even of long standing.

Such being the case it is capable of contributing much to the elimination of the nuisance problem which the mosquito presents. Whether or not it can contribute toward the solution of the health problem depends upon many undetermined factors.

Reference

1. Shannon, W. Ray: Thiamin chloride in the treatment of itching conditions, particularly with reference to infants and children. Urol. and Cutan. Rev., 46:786, (Dec.) 1942.

DIET HINTS FOR REGULAR BLOOD DONORS

Those who are giving blood regularly to the American Red Cross for our fighting men should eat foods that supply plenty of iron, copper and high grade proteins, so that they will quickly build up more blood for themselves and the blood and plasma banks. Under food rationing, this takes a little planning. To help you with this, the American Dietetic Association has published recommendations and a sample menu.

Immediately after giving a blood donation, they advise one or two cups of hot cocoa for nourishment and stimulation. If cocoa is not available, take hot milk flavored as you wish.

Every day eat about four ounces of meat, poultry, fish or soybeans. Include liver or kidney two or more times a week. One-half cup of cooked soybeans is equivalent to about two ounces of edible meat.

One or more eggs should be eaten daily. One-quarter cup cooked soybeans is the equivalent of one egg.

Take one pint of milk or more daily. One ounce of American cheese is about equal to one seven-ounce glass of milk except that it has considerably less of two of the B vitamins, thiamin and riboflavin.

Two or more servings per week of soybeans, dried peas, beans, lentils or peanut butter are advised.

Two or more servings of fruit should be eaten daily. This should include one large serving of citrus fruit or tomato, fresh or canned. Apricots, peaches and prunes are good choices for the second fruit, when you can get them, because of their blood-building qualities.

Two or more servings of vegetables daily, one of them leafy green or yellow, should be eaten in addition to one or more daily servings of white or sweet potatoes.

Whole grain or enriched cereals and whole grain or enriched bread should be used daily. Fats and sweets may be added to, but not substituted for, the above foods. Too much sugar or fat will destroy the appetite for the other foods and may cause an undesirable weight gain. Remember that molasses, sorghum and maple syrup are good sources of iron as well as being good sweeteners for foods. Corn syrup and brown sugar also contain some iron.—*Science News Letter,* August 28, 1943.

CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL

A. J. Hertzog, M.D., and S. V. Lofsness, M.D.
Pathologists

Presentation of a Case
A-43-1181

Dr. Jones: The case is that of a man fifty-six years old who was admitted to the Medical service on July 1, 1943. He was very orthopneic, moderately cyanotic, and complained of moderate pain throughout his mid-chest. He stated that his present illness began about three weeks before admission with a mild upper respiratory infection. After a few days he felt better, but about ten days before admission he noted dyspnea, orthopnea and ankle edema, all of which progressively increased in severity. He became weak and tired and had increasing difficulty in swallowing solid or liquid food. For the past few days he was unable to sleep because of marked respiratory distress, and increasing discomfort and pain throughout his mid-chest.

He had never had orthopnea, chest pain, or edema of his ankles before. However, he had been too weak to work for several years. When 14 years of age, he had tuberculosis of the left hip and an arthrodesis was performed. He was admitted to this hospital for five weeks in 1932 because of a goitre of five years' duration. At that time he complained of generalized weakness and a lumbar backache of a few months' duration. A simple adenomatous goitre was removed and he recovered uneventfully. X-ray of his back showed only lumbar scoliosis, possibly due to his hip deformity. A chest x-ray showed bilateral apical tuberculosis, calcified and fibrous; he had four negative suptum examinations. His backache had persisted ever since, and his weakness had increased, so that he stopped working several years ago. For the past several years he had had a chronic cough, raising small amounts of mucoid sputum, but never blood. His appetite had been poor and he had become quite thin. His goitre had recurred, gradually enlarging for several years. During the past two weeks he changed from a chronic invalid to an acutely ill man.

On admission, his temperature was 99 degrees, pulse 120, respiratory rate 20, and blood pressure 92/?. He was very weak and thin, very orthopneic, and moderately cyanotic. There was moderate edema of his legs. He had a soft, moderately large goitre. His lungs were negative except for a few fine rales at the bases. His heart tones were weak and distant, and irregular; no murmurs were heard. His apical rate was 160, his wrist rate 120. His liver edge was 8 cm. below the costal margin, and it was smooth and tender. No abdominal masses were felt. Rectal examination was negative. His hemoglobin was 80 per cent, his white blood count 11,700 with 83 per cent neutrophiles. His urine had a specific gravity of 1.023, and there was one plus albumin and a few leukocytes. Rytz and Kline tests were negative. An x-ray of his chest showed a heart markedly enlarged to the right and left, and fibroid tuberculosis of both apices. The superior mediastinum was widened by substernal thyroid tissue. It was felt that the large cardiac shadow was due to pericardial effusion, although a dilated heart could not be excluded.

He was rapidly digitalized and given potassium iodide; his pulse rate varied from 80 to 100 until his death. He was tube-fed a high caloric fluid with added vitamins. However, his dyspnea and orthopnea persisted, and on July 4, 1943 his temperature rose to 102 degrees; he became stuporous, had very labored respirations and died the next day.

Intern: What was the clinical diagnosis?

Dr. Lofsness: It was thought that he had hyperthyroidism with thyrotoxic heart disease.

Student: What was the basal metabolic rate?

Dr. Hertzog: His basal metabolic rate was not taken because of his labored respiration; this test is of no value in a dyspneic person.

Autopsy Findings

Dr. Lofsness: The body was emaciated and there was slight edema of the ankles. The left pleural cavity was obliterated by dense fibrous adhesions and contained no free fluid. The right pleural cavity contained about 1,000 c.c. of clear yellow fluid; there were dense fibrous adhesions at the apex. The right lung weighed 560 grams, the left 450 grams. On section, both showed nodular fibrosis of the apex; this extended 2 to 3 cm. down from the apex but there were no cavities or caseous lesions. The remainder of the lungs showed mild congestion and edema. A few of the peribronchial lymph nodes were soft and grey and up to 2 cm. in diameter. Numerous very small white areas were present in some of these nodes. The most striking lesion was a massive pericardial effusion—approximately 1,500 c.c. of dark brown, cloudy, thin fluid. The pericardium was soft and only slightly thickened, and not adherent to the heart. Its inner surface, and the surface of the heart, were covered by a very shaggy, soft, grey, fibrinous exudate. The heart weighed 360 grams and was otherwise normal. The liver weighed 1,180 grams and showed a prominent "nutmeg" pattern on section. The spleen weighed 120 grams and was normal. The remainder of the organs appeared normal, except the thyroid gland which was moderately enlarged, soft, and adenomatous. Through the first, second and third lumbar vertebræ, the spine curved sharply to the right; there were no compressed vertebrae and the bone was normal on section. There was a moderate flexion deformity of the left knee and hip.

Microscopic Study.—The pericardium shows a layer of epithelioid cells and lymphocytes near its inner surface and this is covered by fibrin. The epicardium is similar, but the myocardium appears normal. The apices of both lungs show dense scar tissue. On the left, there is a zone of active tuberculous inflammation adjacent to the scar. The mediastinal nodes show scattered active tubercles. The liver shows severe atrophy and necrosis of the centers of the lobules, as seen with right heart failure. The thyroid gland contains multiple adenomas with nothing suggestive of toxicity. However, it is well to keep in mind the usual inability of pathologists to correlate the histologic structure of an adenomatous goitre with its clinical course.

Dr. Hertzog: This man had x-ray evidence of apical tuberculosis in 1932, at the time of his thyroidectomy. How long it had been present is impossible to state. Apparently the process in the left apex flared up and infected new lymphatics and nodes. Through the lymphatic anastomoses, the pericardium was infected. As is usually the case, this resulted in a bloody, serofibrinous exudate. Tuberculosis is the most common cause of a massive, bloody, pericardial effusion. Although more common, the pericarditis of rheumatic fever usually has less fluid and the fluid is usually reabsorbed in a relatively short time. His difficulty in swallowing may have been due to pressure on the esophagus by the pericardium. His symptoms of right heart failure were probably due to compression of the venæ cavæ and right auricle, as seen in constrictive pericarditis. Tuberculous pericarditis nearly always develops as an extension of a lesion in the lungs, pleuræ, or mediastinal lymph nodes. At times, the pericarditis may appear at first glance to be a primary disease of the pericardium as the tuberculous focus in the lungs or hilar lymph nodes may be inconspicuous and difficult to demonstrate.

Dr. Lofsness: The roentgenologists strongly suggested pericardial effusion from the one picture. If the patient had been returned to them for fluoroscopy, or films taken both while standing and supine, the diagnosis would have been made. Clinically, the low systolic pressure, the distant heart sounds, the large area of cardiac dullness, the substernal pain and the pulmonary tuberculosis suggested pericarditis. No friction rub was present, but that is often the case after a large amount of fluid accumulates. Repeated pericardial paracenteses might have tided him over the acute phase, although it probably would have left him with an adherent pericardium.

Anatomical Diagnosis.—(1) Tuberculous pericarditis with effusion; (2) bilateral pulmonary tuberculosis; (3) chronic passive congestion of liver; (4) adenomatous goitre; (5) old tuberculous arthritis of left hip; (6) scoliosis of lumbar spine.

BREAD AS A DISEASE PREVENTIVE

Bread is now preventing disease. Cases of two vitamin hunger diseases, beriberi and pellagra, have decreased "markedly and unmistakably" in the wards of Bellevue Hospital, New York, during 1942 and 1943, the period when enriched white bread and flour became universally available in that city, Dr. Norman Jolliffe, of New York University College of Medicine, declared at the meeting called by the Food Distribution Administrator to consider compulsory enrichment of all white flour as a war measure.

Only one-fourth as many patients with full-blown beriberi and only one-third as many pellagra patients are seen now in the wards of this hospital as were there in 1939, Dr. Jolliffe stated. He attributes this decrease to the bread enrichment program through which people are getting much more of the pellagra-preventing and beriberi-preventing vitamins, niacin and thiamin, than formerly.

Opposition, strongly vocal and somewhat unexpected, to the proposal for enriching all white flour developed from representatives of the baking industry, who urged enriching bread and other flour products at the bakery, rather than at the mill. Increased costs to bakers; loss of prestige and hurt pride because the bakers have heretofore played a big part in pushing the enrichment program; and fear of possible loss or waste of vitamins either in stored flour or in manufacture of certain bakery goods were the chief reasons given.

Evidence that destruction of vitamins in flour under storage would not be serious, nor the loss in baking crackers and such items very large, was presented by those favoring enrichment at the mill.

Government authorities lean to enrichment at the mill because of greater ease of enforcement of the order. The large number of bakeries, many of them small, would make supervision of enrichment of bread and bakery goods extremely difficult.

Millers seem willing to take on the entire enrichment job. They are already enriching a large proportion of all flour and it is believed very few mills will need any extra equipment to enrich all white flour.

Flour should be enriched at the mill, Dr. Russell Wilder, chief of civilian food requirements branch of the Food Distribution Administration, declared, because the fault has been with the flour, not the bread. Finely milled white flour loses important vitamins and iron in the milling process. Enriching flour at the mill or source, he pointed out, follows the logic of purifying the water supply of an entire city rather than doing the job in each home and public building.

Whether all or only part of white flour is to be enriched, it may be possible to distinguish it after October 1 by a very faint creamy tinge due to the vitamin, riboflavin, which will be a must ingredient in all enriched flour and bread after that date. Riboflavin has a clear yellow color. In flour and bread, however, the color will be so diluted that most consumers probably will not notice it.—*Science News Letter,* August 7, 1943

HISTORY OF MEDICINE IN DODGE COUNTY

BY JAMES ECKMAN
Rochester, Minnesota

and

CHARLES E. BIGELOW, M.D.
Dodge Center, Minnesota

(Continued from August issue)

Dr. James A. Garver (1814-1901), who came to what is now Dodge County as a man of forty-two years, was born in Hamilton, Ohio, on March 19, 1814, the son of Leonard Garver and Katherine Fischer Garver.[197] His family on both sides was of honorable record: his grandfather and great-grandfather both had been soldiers in the Revolutionary War, and his maternal great-grandfather had been a captain under Major General Horatio Gates (1728-1806).[197] Doctor Garver's father was an experienced millwright and taught his young son the use of various tools at an early age. Doubtless the manual dexterity in surgery for which Doctor Garver was later to become well known was engendered by his familiarity with his father's tools as a boy. The young man had very little formal schooling, but in 1834 he began the study of medicine with a physician of Millville, Ohio. In this town, on August 9, 1836, he was married to Miss Eliza Catherine Miller, sister of Dr. William Miller (1806-1873) of Wasioja.[198]

In 1839 and 1840 Garver attended lectures at the Medical College of Ohio at Cincinnati, from which, only a few years previously (1836), the distinguished American geologist and Minnesota explorer, Dr. David Dale Owen (1807-1860), had been graduated, also as a physician.[199] Doctor Garver practiced his profession for a while at Hamilton, Ohio, but in 1852 he moved to Noblesville, Indiana. He was comfortably situated there when in 1856 his brother-in-law, Dr. William P. Miller, persuaded him to emigrate to the Territory of Minnesota. The two men came to Wasioja, near which Doctor Garver preempted a farm of 160 acres.

When the War of the Rebellion broke out Doctor Garver journeyed to Indiana, and became assistant surgeon of the 39th Indiana Regiment of Volunteers,[197] as previously mentioned. He resigned that post in 1862, but at the personal solicitation of Indiana's great war governor, Oliver H. P. T. Morton (1823-1877), he accepted the post of surgeon of the 136th Indiana Regiment of Volunteers.[197] He served in this capacity until the war ended, and his wife served during the war as a nurse attached to the Union forces.

Doctor Garver then returned to his farm near Wasioja, and in 1870 he was appointed county physician at a salary of $50.00 a year.[44] He had previously shared this post (1868 and 1869) with Dr. Reuben Willson (1822-1900) of Mantorville.

In 1866 the Winona and Saint Peter Railway Company completed its line east to west across Dodge County, and the town of Dodge Center was founded

as a railway station a few miles south of Wasioja, which was not on the railroad. The decline of Wasioja soon followed, and in December of 1875 Doctor Garver moved to Dodge Center to enter into a partnership with Dr. Christopher Porter Gibson[66] (1848-1933), who had been in Dodge Center since the year 1873. The two physicians operated a drug store in connection with their practice, and their partnership lasted until 1881 or 1882, when Doctor Gibson removed first to Fairpoint in Goodhue County and then to Concord in Dodge County. In 1884 Doctor Garver took as partner Dr. William H. Parker (1859-1913), and in 1887 he secured as partner Dr. Elias Wells Kellogg (1859-1923).

"He is a kind-hearted, self-sacrificing man," it was written of Doctor Garver in 1884, "and made an eminently useful surgeon. The experience he had in the hospital and on the battlefield has been of great service to him, and increased his professional reputation. Doctor Garver seems to be fully aware that medical science has constant growth. He aims to keep up with its progress, and to this end has visited frequently the hospitals and lecture rooms of the medical colleges in the East, thus brushing up his knowledge of the healing art."[197]

On December 19, 1883, Doctor Garver received License No. 456 from the Minnesota State Board of Medical Examiners.[40] He was licensed by exemption.

As he grew older it appeared that he lost little of his accustomed vitality. In 1893 it was observed that "Doctor Garver is on our streets and carries his 80 years with ease."[200]

Doctor Garver was known personally to one of the authors (Bigelow). He was rather short and strongly built, and always wore a full beard, with his hair long. He was of a kindly disposition and had a ready, friendly smile. His voice was soft, and he made many friends easily. One of us (Bigelow) still has a dissection set which Doctor Garver presented as a gift when the writer in question began the study of medicine.

Doctor Garver died at Dodge Center on December 14, 1901, at the age of eighty-seven years. He might have lived even longer, had it not been for an accident. He had arisen in the morning to warm himself at an open fire in his home, and his nightshirt caught fire. He died at midnight of the same day, of burns and shock.[201]

Dug out of the rocky summit of a steep, pine-crested bluff overlooking a branch of the Zumbro River in the Wildwood Cemetery at the half-forgotten hamlet of Wasioja is a crumbling burial vault. The outer wall of the vault now leans precariously forward, as if at any moment it might plunge down into the stream some seventy feet below, and the iron door of the vault lies useless in the leaves and rubbish on the floor inside. This is the receiving vault to the Wasioja cemetery which Doctor Garver was largely responsible for having constructed about a half-century ago. By a sepulchral stroke of irony, the man who secured the building of the vault was also the first to occupy it as a corpse.[201] His coffin was deposited there on December 16, 1901, and was not interred until the coming of spring in 1902. On a Sunday in April Doctor Garver was buried in the cemetery, and it was said that no less than 800 persons attended the ceremonies. "They came by special trains, which were crowded, by 150 carriages and numbers on foot."[202]

Dr. Edward Payson Kermott (1825-1872) is said by his nephew[203] to have been born in Halifax, Nova Scotia, in the year 1822. Records of the Adjutant General's Office of the War Department,[204] however, indicate that he was born in Woodstock County in the Province of New Brunswick. When Doctor Kermott enlisted in the army in 1864 he gave his age as thirty-nine years,[204] which would suggest that he was born in the year 1825. It was said[203]

that Doctor Kermott had been graduated from the University of Michigan Department of Medicine and Surgery, but the Alumni Association of the University of Michigan[205] has no record that he ever attended that institution. At some time not now known he was married to Elizabeth Plews, of Coburg, Ontario, Canada.

As has been said, Doctor Kermott practiced in the hamlet of Rice Lake in Dodge County, and he seems to have been in some demand as an exodontist. In about 1858 or 1860 he moved to Wasioja, where his son, Dr. Edward Plews Kermott (1860-1938), was born. The junior Kermott was graduated from the Rush Medical College of Chicago, in 1886, and died in Glendale, California, on August 8, 1938.[206]

Dr. Edward Payson Kermott seems to have been at one time a justice of the peace in Wasioja. A description[207] of one of his experiences was written in 1884:

> A gentleman whose name was W. L. Langdon commonly known as "Wood Langdon" invested quite a large portion of his wealth in hides. These he brought to Wasioja where the redoubtable "Curt"* and possibly others of a like speculative turn of mind borrowed them without his knowledge or consent. "Wood" sought legal counsel and was advised if he could find the hides to take them. He found them and took them but much to his astonishment and indignation he was at once arrested for stealing and brought before E. P. Kermott, a justice of the peace, for trial. S. L. Pierce then a young and also a muscular attorney appeared as his council. It would seem to be an easy matter to clear a man accused of stealing his own property, but it was not in this case. For the judicial vision of the justice had become so perverted by the "frontier whiskey" which the complainants had kindly furnished him that it was beyond the power of human wisdom to determine how much or how little of the truth he could or would see. Pierce endeavored to get the case adjourned till the "judge" could sober up or to have a change of venue but his honor was bent upon a speedy trial and he got it, for Pierce disgusted with the whole condition of affairs concluded to apply a principle of jurisprudence not found in the books and seizing the bacchanalian justice by the beard he with few appropriate quotations "chucked" him under the table, from which his honor protruding his head as far as he dared cried out, "I fine you five dollars for contempt of court." It is enough further to know that Langdon regained his liberty and kept his hides and that the fine against the energetic attorney was remitted.

Doctor Kermott enlisted in the United States Army on February 26, 1864, at Richland, Minnesota, for a term of three years, and he was mustered into the service on the same date at Rochester, Minnesota.[204] He served at first as a private soldier of infantry in Company C of the Sixth Minnesota Regiment of Volunteers, and on June 13, 1865, was promoted to the rank of corporal. He was honorably discharged from the army at Fort Snelling on August 19, 1865.[204]

From this time onward little is known about Doctor Kermott. Armstrong[208] has shown that he was one of the founders of the Minnesota State Eclectic Medical Society at Owatonna on May 26, 1869. It is believed that in his latter years Doctor Kermott practiced medicine in or near the village of Elysian in Le Seuer County. The director[209] of reference service of the National Archives at Washington has reported that Doctor Kermott died in Elysian, Minnesota, on August 15, 1872, and that this date of death was accepted as valid by the Pension Office, which in 1873 granted Doctor Kermott's widow a pension. The secretary of the Minnesota State Board of Medical Examiners has reported that Doctor Kermott was never licensed to practice medicine in Minnesota.[210] Woods[13] remembered Doctor Kermott as a red-haired, bearded man who seemed to have traveled about in the vicinity of Rice Lake and Wasioja, pulling teeth when such services were required.

*A certain light-fingered resident renowned for his escapades.

Unfortunately, very little is known about the early life and career of **Dr. Augustus O. Potter** (?-1864) of Mantorville, aside from the fact that, as previously mentioned, he came to Mantorville in 1858. He came to Dodge County from Pennsylvania, which was the native state of several early pioneers of Dodge County, and it may be that he was born there. A record of Doctor Potter's heroic labors during the War of the Rebellion, in which he gave his life as surely as those felled by shot or bayonet, has been preserved.[211]

The Sixth Regiment of Minnesota volunteers was organized in the summer of 1862. It had been promised that as soon as the regiment should become full, it would be sent to the South; but in the meantime the Sioux Indian uprising had occurred. The regiment therefore proceeded west, where it took part in the battle of Birch Coolie, Wood Lake and the rescue at Camp Release, and it made expeditions even further to the west in 1863. Not until the end of June in 1864 did this regiment reach the South, and then it went to Helena, Arkansas.

Doctor Potter had joined the regiment at Camp Release on August 23, 1862, as an assistant surgeon, and had thus served in the Indian campaign and the expedition to the west. At Helena he encountered what no doubt was the most difficult situation in all his career in medicine:

> Its ranks were full when the Sixth Regiment arrived at that Southern pest-hole, but soon reports reached us relating with what fearful rapidity the flower of our young state was stricken down by malarial diseases. The report for the month of September showed but one hundred and forty men for duty. Many had died; others, too sick to be removed, were not expected to recover, while four hundred and sixty-one had been sent to Northern hospitals.[211]

The evidence shows that Doctor Potter did heroic service to the shattered regiment. Doctor Potter toiled ceaselessly, but soon fell victim to the disease he was so relentlessly attacking. He died at Helena on September 13, 1864. Doctor Belden, as quoted by Johnson,[211] wrote of him on October 29 of that year:

> . . . Some three quarters of a mile up town were three stately private rebel dwelling houses, filled and overflowing with another large number of sick officers and men from the regiment; the remainder of the men were jaundiced and sallow, and rapidly falling down with sickness. The lamented assistant surgeon, Dr. O. O. Potter [*sic*], had just lost his life, heroically battling against the increasing ravages of disease among his fellow officers and men. . . .

Johnson[211] contributed a short reference to Doctor Potter that seems to imply that the physician was poisoned by one of his own comrades:

> The next to resign was Doctor Wharton, on July 29, 1864. He had worn himself out in attendance at hospital, and the prevailing malaria prostrated him, rendering it hazardous to remain. The regiment was then in deep distress, Doctor Potter being the only dependence, and he literally overwhelmed with work, night and day, Assistant Surgeon McMasters being at the mouth of the White River with the men there. Night and day Potter could be seen going through the camp, with his shirt-sleeves rolled up, bottles and powders in both hands, attending to the urgent calls upon him. How shocked we were to hear, upon the morning of September 13, that Potter was dead! How infinitely more shocked when suspicion of poisoning him fell upon one of our comrades! Noble Potter! His body was taken to Minnesota for burial. . . .

It will be noticed that Doctor Kermott had enlisted in the same regiment (the Sixth Minnesota) as that in which Doctor Potter was assistant surgeon. It is not known definitely that Doctor Kermott accompanied the regiment to

Arkansas, but it seems certain that the two physicians, who lived in the same county, knew each other.

Dr. John Quincy Adams Vale (1825-1903) was born on August 25, 1825, in Columbiana County, Ohio.[212] In 1850 he began to practice medicine in Meigs County, Ohio, and five years later he came to Pine Island in Goodhue County, Minnesota.[212] As has been said, Doctor Vale was elected first chairman of the board of supervisors of Milton Township in Dodge County in 1858,[5] and was re-elected to that post in 1859.[5] The authors are not prepared to say that Doctor Vale was a resident of Dodge County on the basis of his election to the aforementioned post, but it is assumed that he was. In 1861 Doctor Vale moved to Homer in Winona County, where he lived for many years. He erected or at least owned a sugar mill there,[213] and seems to have been a prosperous citizen. In 1868 he was elected to the Minnesota House of Representatives, and served in the eleventh legislature, which convened from January 5 to March 5, 1869. He was thus one of the legislators who passed the old medical practice act of 1869, previously mentioned herein.[96] He was a charter member of the Winona County Medical Society, organized in April of 1869,[173] and he retained his membership in the society until his death in 1903. He was elected to membership in the Minnesota State Medical Society on February 1, 1870, at the first annual session of that body in Saint Paul, and was thus almost a founder, also, of that organization. Doctor Vale was an enthusiastic Republican, active in nearly all the activities of that party in Winona County. In October of 1869 he helped found the Republican county convention, and in 1875 was chairman of the Republican county convention.[213] He was town clerk of Homer in 1869 and again in 1876. At some time in the latter year he moved to the city of Winona so that his children might be educated in the schools of that place, but it is thought that in 1881 he returned to the village of Homer.[213] In 1882 he was a delegate of the Winona County Medical Society to the thirty-third annual session of the American Medical Association at Saint Paul on June 6, 7, 8 and 9.[185] He died in Homer on September 2, 1903.[212]

Dr. John Jacob Everhard (1829-1908) was born in Doylestown, Ohio, on November 25, 1829, the son of John Jacob Everhard and Mary Harter Everhard.[214] His father was a farmer, a native of Wayne County, Ohio, but of Pennsylvania German ancestry, and a veteran of the War of 1812.[214] The young man was reared on his father's farm, and after a preliminary education in the public schools, attended the McGregor Academy at Wadsworth, Ohio. At the age of twenty years he went to Janesville, Wisconsin, where he taught school and speculated moderately in wheat. He then began the study of medicine at Ripon, Wisconsin, with his brother, Dr. Aaron Everhard, and he later entered the Rush Medical College of Chicago, where he studied for three years. He was graduated as a physician in the spring of 1856, and returned to Ripon to practice. In 1859 he came to Owatonna in Steele County, Minnesota, and in March of 1860 he moved to Mantorville in Dodge County, where he was to remain until the spring of 1874.[214] His daughter[215] reported that Doctor Everhard's first call when he settled in Mantorville was to the bedside of a patient who had been bitten by a rattlesnake. On March 14, 1863, at Chatfield, Minnesota, Doctor Everhard was married to Miss Narcissia V. Gertrude Scoville, a native of Conneautville, Pennsylvania.[214]

Doctor Everhard, probably because of physical disability of some sort, did not serve in the War of the Rebellion. "During the Civil War Dr. Everhard was almost alone in the county, and did a very large and successful business," it

was written.[214] "Soldiers and their families were treated free, and in this way he expended several thousand dollars' worth of labor."

In May of 1874 Doctor Everhard moved to Kasson,[65] where, according to his daughter,[215] he made most of his professional calls on horseback, because the roads were then impassable to teams. Later, as the roads gradually improved, he kept five horses because his calls were so numerous that some of the animals had to rest while he harnessed fresh ones and set out again. He frequently consulted Dr. William W. Mayo (1819-1911) of Rochester, his daughter wrote.[215] He was elected to membership in the Minnesota State Medical Society on June 6, 1882, at the fourteenth annual session of that body at Saint Paul.[216] On November 23, 1883, he was licensed to practice medicine in Minnesota, receiving License No. 359.[40]

Mrs. Everhard's father had come to Mantorville in 1854, but had later decided to emigrate to Kansas and had done so. Doctor Everhard was frequently urged by his wife's father and mother to join them, and in April of 1890 he finally decided to move to that state.[143] He lived there for the rest of his life, and was licensed to practice medicine in Kansas on October 10, 1901.[126]

So far as is known, Doctor Everhard did not return to Dodge County thereafter. In May of 1908 he accompanied his wife on a visit to the home of their daughter, Mrs. W. G. Hegardt, in Duluth.[215] He was not well when he arrived in Duluth, and was not able to leave his room. His health declined rapidly, and he died in that city of senile debility and arteriosclerosis on August 30, 1908.[217] He was buried in Forest Hill Cemetery in Duluth.[215]

Lord[1] remembered Doctor Everhard as a wiry, active man of medium size, who had a sharp tongue and a keen restless mind. He wrote[1] that Doctor Everhard was never at a loss to express his opinion of anyone, but that he was also generous, kind-hearted and eager to care for the sick, rich or poor. Doctor Everhard's skill as a physician was said[1] to be such that his practice included residents of Olmsted, Goodhue and Mower Counties, as well as those of Dodge County. It was said[1] that in moments of distress or uncertainty his professional enemies would abandon their pride and seek the counsel of Doctor Everhard. His chief diversions seem to have been politics and hunting. He was an ardent Republican, influential in the affairs of that party, and Lord[1] described him as being one of the finest shots in the county.

(To be continued in the September issue.)

President's Letter

A few days ago the writer of this letter, standing in a long queue of people waiting to have their gasoline ration books exchanged for the new form, was interested in the reaction of his neighbors in the line to the restrictions imposed upon their normal activities by a presumably benevolent bureaucracy. The man in front of him owned some farms in North Dakota but the Ration Board had denied him gasoline with which to go out and superintend the harvesting of the crops. The man behind was a traveling salesman who was unable to get sufficient gasoline to enable him to cover his territory and, as a corollary, would have to curtail his usual monthly purchases of War Savings Bonds.

We do not intend to discuss the pros and cons of rationing of gasoline and other commodities, or the merits of the cases of his neighbors in the queue, but the incident was interesting as an illustration of the reaction of average Americans to arbitrary interference by government bureaus with what they regard as normal and proper and necessary activities. Mark Twain's famous remark about the weather—that everybody complains, but nobody does anything about it—seems pertinent to the situation referred to above.

With these considerations in mind, a meeting held in Minneapolis on August 16, takes on peculiar significance, for that meeting was evidence of an attempt to "do something about it." To this meeting, a group of Congressmen and Senators representing five North Central States, came as listeners, to learn at first hand the desires of their constituents. Congressman A. H. Andresen of Minnesota, who acted as Chairman, stated the purpose of the meeting in the following language: "This will be a meeting where Congressmen and Senators will be the listeners and not the speakers. They are anxious to ascertain the sentiment and feeling of the people in an effort to secure information on the effect of present policies on business, the professions and farming, in order to legislate more intelligently when Congress reconvenes on September 14."

The meeting was largely attended and the speakers pulled no punches but voiced their feelings in plain language. After the representative of the raspberry pickers from Hopkins had finished, there was no suspicion in the mind of any listener that the town had been named in honor of Harry Hopkins, of the New Deal Hierarchy. Senator Oscar Swenson, representing the Minnesota dairymen, made it clear that the dairymen wanted no part of regimentation or control by a Bureau in Washington. In spite of an unpleasant incident at the State Capitol last spring, we are glad to acknowledge that Senator Swenson has always been a friend of the medical profession. He is no more interested in control by government and politicians than we are and we can meet on common ground in striving to uphold American principles in government. In fact, Congressman Karl Mundt of South Dakota suggested that, since all the groups—farmers, businessmen, professional men—had voiced opinions which were fundamentally the same and all opposed to regimentation, political control and government by executive orders and directives from bureaus, they should all write in some plan for taking concerted action.

Congress, if the attitude of the men present at this meeting is any indication, is in the mood to reclaim its powers and prerogatives under the Constitution. Our representatives in Washington should be supported in that attitude. They will not be misled into adopting un-American panaceas for all our economic, social and medical problems if they are convinced that the folks back home are vitally interested in the perpetuation of the American way. With the preservation of liberty under the Constitution no group need have any fear of the future; without it, the details of production and distribution of commodities sink into insignificance, for we will have no voice in them.



President, Minnesota State Medical Association

Editorial

Carl B. Drake, M.D., *Editor;* George Earl, M.D., Henry L. Ulrich, M.D., *Associate Editors*

CONGRESS AND SOCIALISM

THE medical profession is back of the national government without reservation in our war effort. The 45,000 medical men now in the armed forces are proof of this assertion. The profession, however, is just as wholeheartedly opposed to the tendency and threats in Washington to eliminate private industry and freedom of initiative in our country. This is evident from the editorials which have appeared in our state medical journals, one of which is reproduced in this issue, inspired by the submission of the Wagner-Murray bill to Congress. Our numbers are some 45,000 fewer at the home front as a result of the war. Those of us who remain at home have the responsibility of doing everything in our power lest our confreres return to an absolute system of state medicine, with the Surgeon General of the United States Public Health Service the dictator of medical practice in these United States.

The idea of the meeting of Senators and Congressmen at the Radisson Hotel in Minneapolis, August 16, for the purpose of allowing representatives of the various groups of American citizens to express their views on national problems was well conceived. While many of the objections voiced were objections to regulations incident to the war, some of them trivial but many real grievances, the entire tenor of the meeting was the emphasis or the desire to preserve the American way of private enterprise. A detailed report of the meeting appears under the Medical Economics section of this issue.

After all, the public through their representatives in Congress, will decide whether they wish to continue private enterprise or prefer to increase the part of the government in industry or even to maintain the domination of government, now a necessary war measure, after the war is over. The proposed socialization of medicine will, if accomplished, be just one step to be followed by others in the socialization of industry. The occasion of the country at war is no time to make revolutionary changes such as the socialization of the practice of medicine. The provision of medical care to the American people has been going through an evolutionary process which has resulted in a continuous improvement in the medical care rendered. This evolutionary process should be allowed to continue instead of scrapping the entire present system of American medicine.

U. S. CADET NURSES CORPS

TO meet the dearth of trained nurses in war and civilian practice the Bolton Act was approved June 15. Under this act the government through payments to coöperating hospitals will pay tuition, stipends, maintenance fees and for uniforms including a street uniform for nurses in training. Any student nurse who has been in training since January 1, 1941, is also eligible to join the corps. The prospective nurse may choose any hospital which has agreed to the arrangement.

The trainee in joining the corps agrees to make her services available to the government or for essential civilian nursing duties for the duration of the war.

Training courses will be speeded up to twenty-four or thirty months. Stipends will be paid trainees of $15.00 to $30.00 a month depending on the stage of the training.

It is estimated that some 65,000 new student nurses are required at once. This means that about one in every ten girl graduates from the high schools of the country are needed for the corps.

The Bolton Act is an attempt at the solution of the problem of obtaining more nurses for the armed forces, governmental and civilian hospitals, health agencies and war industries. The act was drafted with the full coöperation of nurse training institutions, hospitals, the nursing profession and governmental agencies.

The method of providing free training for medical students has been extended to the nursing profession. Although there may have been some question of the need for this method in order to

fill the medical schools to full capacity, there is justification of the plan in obtaining a sufficient number of trained nurses.

Physicians can be of service in obtaining the required number of prospective nurses by urging young women with proper qualifications to take advantage of the free training offered. Reference may be made to the Hospital Number of the *Journal of the American Medical Association* (March 27, 1943) to obtain the names of hospitals having accredited nursing schools.

SULFONAMIDE SENSITIVITY

SO effective is sulfonamide therapy in such a wide field of infections that it has rather facetiously been said that medical practice today consists in the determination of an infection and the administration of a sulfa drug. One call suffices.

Evidence[1] has been developed that the indiscriminate prescribing of the sulfonamides is not good practice.

Reports[2] have appeared of the development of marked sensitivity following the local use of sulfonamides in chronic eczematous skin lesions complicated by secondary pyococcic infection when the drug has been applied five days or more. Later administration of the drug, even in small doses, has resulted in a marked systemic reaction with fever, edema, itching palms and soles, chilliness, and a macular or vesicular eruption within a few hours. Strangely, the local use of these drugs in acute skin conditions such as impetigo, acute pyogenic complications of fungus infections or poison ivy does not seem to produce this sensitivity.

According to Lyons and Balberor,[3] a third of those who take sulfa drugs by mouth also develop a sensitivity. This may develop as early as nine days following the first dose and may last as long as two years. So-called "sulfonamide shock" may make its appearance on the administration of the same sulfa drug or even one of the other sulfa drugs at a later date.

The presence of a sensitivity cannot be determinated in advance by the patch, scratch or intradermal test, and the first indication of the presence of a sensitivity is the reaction following the later administration of the drug.

It is logical, therefore, not to prescribe the sulfa drugs for minor infections in which other therapeutic measures are highly satisfactory, and this would apply particularly to chronic skin infections. The drugs are so efficacious in many of the more serious infections that it is highly desirable to reserve their use for such possible future need.

The subject is of great importance. Many fatalities are already known to have resulted from the use of these sulfa drugs. Many thousands of lives, on the other hand, have been saved by them. Additional thousands of people have taken the drugs and perhaps a third have developed a sensitivity to them. The subject was considered important enough for the Section of Dermatology and Syphilology of the Medical Society of New York to pass a resolution at its May meeting, going on record against the indiscriminate use of the sulfonamides and condemning the use of prepared dressings containing these drugs. The profession should be prepared for the occurrence of "sulfonamide shock" where there is a history of their previous administration.

References

1. Editorial: Sulfonamide sensitivity. J.A.M.A., 119:1202, (August 8) 1942.
2. Livingood, C. S.: Sulfathiazole in eczematous pyoderma. J.A.M.A., 121:406, (February 6) 1943.
3. Lyons, R. H., and Balberor, H.: University Hospital Bulletin, Ann Arbor, 7:19, (March) 1941.

SPONTANEOUS PNEUMOTHORAX

ALTHOUGH it may have been the common impression years back that spontaneous pneumothorax is due to tuberculous disease of the lung, it is now generally accepted that such is not the case.

This was well brought out by Ornstein* in a Quiz on Diseases of the Chest at a meeting of the American College of Chest Physicians, June 6, 1942.

In the first place spontaneous pneumothorax occurs commonly in young, robust males and seldom in young women. This, in itself, is not in keeping with a tuberculous etiology, as tuberculosis is more common in young women than in young men. Furthermore, many who experience an attack of spontaneous pneumothorax have a negative tuberculin reaction, and most fail to show evidence of pulmonary tuberculosis in later years.

In the mechanics of the production of this condition, air in the lung tissue obtains access to the pleural cavity. Pathologists frequently encounter emphysematous blebs in the apical region of

*Ornstein, George G.: "Information Please": a quiz on diseases of the chest. Dis. Chest, 9:363, 1943.

otherwise healthy lungs. It seems very logical to assume that the rupture of one of these blebs is the basis of the production of the pneumothorax.

During coughing or certain types of strenuous exercise, the glottis is closed, and the respiratory muscles are contracted, thus increasing the intrapulmonary pressure. Repeated violent exertion or coughing may rupture the elastic fibers in a lung alveolus and produce a pleural bleb. The author mentions that a ball-valve mechanism may gradually distend the pleural bleb to the point of rupture.

The lighting up of the lung apices under the fluoroscope on coughing or grunting proves that there is a distention of the apices with increased intrapulmonary pressure. The question arises whether we may not expect an increase in spontaneous pneumothorax as a result of the cigarette cough.

THE MINNESOTA PUBLIC HEALTH ASSOCIATION

AT THE meeting of the House of Delegates held at Minneapolis in May, it was suggested that as there seems to be some confusion in certain quarters as to the status of the Minnesota Public Health Association, some explanation of the nature and function of this organization might be made in MINNESOTA MEDICINE.

Organized in 1906 as the Minnesota Association for the Prevention and Relief of Tuberculosis, the Association was commonly known as the Anti-Tuberculosis Society. It was incorporated, however, in 1914, under the laws of Minnesota as the Minnesota Public Health Association. The organization is made up of component county units. In Minneapolis, the unit is known as the Hennepin County Tuberculosis Association, and in Duluth as the Tuberculosis and Health Association of Saint Louis County. In Saint Paul, it is the Ramsey County Public Health Association, the county name being given to the association, as is the case in the other counties throughout the state.

The organization is a voluntary one and is supported by the sale of Christmas seals each year. It has no connection with the United States Public Health Association, although its name suggests it might be a component part. The United States Public Health Association is a governmental organization headed by its Surgeon General, and its function is national in scope, having to do with quarantine of communicable diseases at ports of embarkation and the like.

The MPHA is in turn a component part, with similar state associations, of the National Tuberculosis Association. The national organization is supported by the allocation of 5 per cent of the money collected in each state through the sale of Christmas seals, the remaining 95 per cent being spent in the state—a portion by the state organization, and the remaining part by the county organizations. While the major part of the activities of the state and county organizations is directed against tuberculosis, their programs include other activities more specifically in connection with the health of school children.

Elsewhere in this issue appears an article by Dr. E. A. Meyerding, for many years Executive Secretary of the MPHA, and one who has been largely responsible for its growth in recent years, which gives a good picture of the organization.

STATE COMMITTEE FOR NURSES

The War Manpower Commission has placed nursing under the Procurement and Assignment Service. The responsibility for planning for the supply and distribution of nursing service has been delegated by the War Manpower Commission to the State Nursing Councils for War Service.

In Minnesota, the former State Supply and Distribution Committee of the Nursing Council will serve as the State Committee for Nurses of Procurement and Assignment, War Manpower Commission. Miss Henrietta Davis is Chairman. The membership of this committee is representative of various fields of nursing and also includes a physician. Dr. Walter Gardner is the Minnesota Medical Association member on the State Committee.

The local unit of organization is the Local Nursing Council for War Service. The chairman of this council in each county is the nurse who is the liaison between the nurses employed in local communities in the county and the State Committee for Nurses of Procurement and Assignment Service.

The War Manpower Commission has issued the following instructions for nurses and their employers. There is no prohibition in the order or regulation that would prevent any nurses from becoming members of the armed forces.

1. Nurses may move as freely as before within the profession, so long as the job transfer does not bring a higher salary or wage rate.
2. A nurse who is now employed in an activity other than an essential activity may accept a job in the nursing field at any salary or wage rate.
3. Nurses can transfer to new positions which bring a

higher salary or wage rate only if they secure *statements of availability* from their present employers.

Statements of availability are issued when:

1. Nurse has been dismissed.
2. Nurse is laid off for an indefinite period or for *seven* or more days.
3. Nurse is not employed at her highest skill.
4. Nurse is not employed full time.

If employment problems cannot be managed in counties they may appeal to the Regional Committee Chairmen for assistance. The Chairmen are:

Area I—Miss Milada Botten, 1100 Donaldson Bldg., Minneapolis
Area II—Mrs. Madeline Bradford, 612 E. 3rd, Duluth
Area III—Miss Lyla Olson, Kahler Hospital, Rochester
Area IV—Miss Clara Webber, 484 Lowry Medical Arts Bldg., St. Paul.

Regional Areas	*Counties*
I	Benton, Carver, Hennepin, McLeod, Meeker, Mille Lacs, Morrison, Sherburne, Sibley, Stearns, Wright Becker, Clay, Douglas, Grant, Otter Tail, Todd, Traverse, Wadena, Wilkin, Cass½ Big Stone, Chippewa, Kandiyohi, Lac qui Parle, Pope, Renville, Stevens, Swift, Yellow Medicine
II	Kittson, Mahnomen, Marshall, Norman, Pennington, Polk, Red Lake, Roseau, Aitkin, Carlton, Cook, Crow Wing, Kanabec, Lake, Pine, St. Louis ½ Itasca, Koochiching, St. Louis ½ Beltrami, Cass ½, Clearwater, Hubbard, Lake of Woods
III	Blue Earth, Brown, Faribault, Freeborn, Le Sueur, Martin, Nicollet, Waseca, Watonwan Dodge, Fillmore, Houston, Mower, Olmsted, Steele, Wabasha, Winona Cottonwood, Jackson, Lincoln, Lyon, Murray, Nobles, Pipestone, Redwood, Rock
IV	Anoka, Chisago, Dakota, Goodhue, Isanti, Ramsey, Rice, Scott, Washington

---

"FROM BISMARCK TO BEVERIDGE" PLUS WAGNER AND MURRAY

What a headache for the unsuspecting American people who truly represent pioneering stock. A people who ran away from unwarranted political domination only a few generations ago cannot accept such a total resubmission, with the sacrifice of many personal liberties, without a sense of distinct loss. Our citizenry should know that Social Security Legislation, including compulsory health insurance, had its origin in Germany where the common people have never seen the light of liberty, therefore, never happy without regimentation.

With the vision of a poet and the education of a doctor, Frederich Schiller cried out against the injustice of government control and military discipline. His stinging tragedy "The Robbers" tells the story of his rebellion and his "William Tell" depicts his love of liberty as portrayed in a true democracy. Duke Charles could force upon the uninterested Schiller the study of law, later he could selfishly approve the less objectionable study of medicine, he could temporarily silence the freedom of speech but never the freedom of thought, neither could he stay the secret record of Schiller's restless pen which proved a powerful vehicle against the evils of a merciless discipline. In this connection, we cannot refrain from quoting Karl Moser, who at the moment of bitterness, said, of his own nation, "Germany is a great, but despised people . . . my heart trembles at the sight of our chains." The same author, in an attempt to ascribe to every nation a governing principle, says, "In England it is liberty; in Holland, truth; in France, the honor of the king; while in Germany, it is obedience."

All this for the purpose of calling attention to the fact that it was in this national atmosphere that modern, socialized medicine was born. Bismark, with the sagacity of a true politician, rather than the clear vision of a poet, seized his opportunity and as the real spokesman through the mouth of the Emperor, sent his plan for accident insurance to the Reichstag as a message from the throne. This was in November, 1881. In the spring of 1882, Bismarck had two bills before the Reichstag; the Accident Insurance Act and the Sickness Insurance Act. The debate upon this proposed legislation was tempestuous. Bismarck was accused of being a socialist and charged with a desire to destroy individualism. This opposition, however, came from the conservatives and represented the vain periscopic view of those not yet hopelessly submerged. Next in succession came the Old Age and Health Insurance and, finally, the Unemployment Insurance. In justification of the accusation that Bismarck was politically sagacious, it should be remarked that he argued that the best way to secure and maintain existing political policies was to place the people under obligation through paternalistic practices. In the Fourteenth Edition of the Encyclopedia Britannica, Erich Brandenburg, lecturer in Philosophy and History at The Prussian Akademie der Wissenschaften, Berlin, says, "The people was and remained in his eyes purely a thing to be governed, unfit, in his opinion to influence the conduct of its own affairs in any large degree."

Unfortunately, England has already slipped into the whirling vortex and is now being urged to feed the last vestiges of professional freedom into the political shredder. Those who may question this statement should read the Beveridge Report, the Report of the Planning Commission of the British Medical Association and, finally, the Report of the Medical Research.

The United States is likewise slipping. Bismarck's wildest dreams never surpassed the provisions of the Wagner Bill, S. 1161, which is now before the Congress of the United States. Time and space will not permit an analysis of this proposed legislation, but every doctor is urged to secure a copy at once in order that he may study its contents and point out to his patrons the undemocratic provisions which virtually will destroy the time-honored patient and doctor relationship so vital to a free people. Contemplation of this bill is not only confusing but depressing. If it becomes law many members of the medical profession may find themselves sitting in the sad twilight of their freedom, looking upon the mangled torso of their humanitarian dreams. The proposed administration of this bill provides for a board containing a majority of laymen. But this is not surprising. With few exceptions, experience shows that in a bureaucratic government, slave driving is the prerogative of laymen arriving at the port of bureaucratic authority without justifiable portfolio.—Editorial by L. J. Moorman, reprinted from the July, 1943, issue of *The Oklahoma State Medical Journal.*

A new hypodermic injector has no needle. Instead the liquid is expelled in a fine stream under sufficient pressure to puncture the skin and inject itself into the tissues, according to the inventor. Only a microscopic hole results. Depth of penetration is controlled by varying the pressure and the quantity of liquid injected. The patient has the sensation of a slight breeze blowing against the skin, it is reported, rather than a sensation of pain.—*Science News Letter,* August 7, 1943

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

CONGRESSMEN LISTEN TO PROFESSIONS BACK HOME

There was a remarkable similarity in complaints and suggestions brought to the delegation of eighteen Northwest congressmen who met with farmers, small businessmen, manufacturers and professional men of five states in a novel hearing staged for their benefit in Minneapolis, August 16.

A total of 2,500 of the men and women who are carrying wartime burdens at home were present from Wisconsin, Iowa, North and South Dakota and Minnesota at the conference and the interest displayed was so impressive that similar meetings were planned immediately in other sections of the country as well as in individual counties here.

Bureaucracy Opposed

In substance their common plea was this: We all realize that there is a war on and that emergency regulations are necessary. But we want those regulations made by men who have some familiarity with our problems so that they may help, or at least not hinder us, in doing our part for the war effort. Above all, we are opposed to government by bureaucracy. We fear that bureaucracy is becoming intrenched in Washington, that it will destroy individual initiative in business and the professions alike and do away with representative government in the United States.

Congressman August Andresen of Minnesota arranged the conference and acted as chairman. Agriculturalists, from truck farmers to farm machinery salesmen, presented their views in the morning. The afternoon hearing was devoted to merchants, small businessmen and manufacturers and the evening to doctors, dentists, druggists and hospitals.

They Fear Regimentation

Prepared statements were presented at the evening session by Mr. J. B. Slocumb of St. Paul, executive secretary of the Minnesota State Pharmaceutical Association for the druggists; Dr. Lester Webb of Fairmont, president of the Minnesota State Dental Association, for the dentists; Rev. L. B. Benson of St. Paul, president of the Minnesota State Hospital Association, for the hospitals, and Dr. A. W. Adson of Rochester, for the physicians. They dealt with difficulties special to their own fields. It was noteworthy, however, that all expressed a common fear of regimentation after the war.

In behalf of the physicians Dr. Adson asked, in brief:

That economy be practiced in government, that states rights be preserved and that individual initiative be protected.

That medical education be permitted to return to its normal status after the war.

That medical officers whose military duties differ considerably from civilian practice be provided with opportunities for post-graduate education so that they will be prepared to return to their own communities and patients.

That emergency assignments of physicians from the United States Public Health Service to serve communities now temporarily without physicians not be permitted to establish a precedent and prevent the return of physicians to private practice after the war.

That the best possible facilities be provided for care of injured veterans; but that thought be given to the possibility of utilizing civilian institutions instead of over-building Veterans' Administration facilities.

That the indigent be given adequate medical care, along with other necessities of life, at public expense.

That others be encouraged to budget their medical expenses to take advantage of hospital programs and provide their own disability insurance.

Voluntary Plans Preferred

That, for low income groups, voluntary pre-

payment plans be promoted, if they are needed, in preference to plans established by federal agencies and controlled by political bureaus because they will render a more satisfactory medical service.

That committees on public health be established in both houses of Congress.

That a Department of Health be created to be headed by a physician who will have full rank as a cabinet officer.

Extemporaneous discussion was chiefly concerned with medical service and the above suggestions from the physicians. It was apparent that the entire group was in general accord as to policies; but Congressman Andresen took exception to the proposal for a federal Department of Health.

"We May Be Skeptical"

"We may be a bit skeptical about a department of health," he said, "because it seems to be the procedure to place people who know nothing about the field in question at the head of government departments. We are just a little bit afraid of whom they might put in the job.

The Wagner-Murray-Dingell social security bill came up for discussion and Congressman J. P. O'Hara, also of Minnesota, pointed out that the bill will have tremendous appeal. Arguments for it will be on the basis that many people cannot now afford good medical service, he said, and that the government must provide that service. He asked how the doctors would answer that argument.

In response, Dr. Adson emphasized two major objections, the exorbitant cost of the bill and the inevitable damage to initiative, quality and research. He said that the proposal would take three billion dollars annually out of the pay checks of workers as deductions and in increased cost of consumer goods; and that as much money would be set aside for administration, alone, as for total medical services. He called attention to the Minnesota plan for care of relief patients in which county responsibility and close coöperation of physicians are basic principles, as a sound approach to the problem.

Would Scrap System

Dr. W. H. Judd, congressman from Minnesota, noted in further discussion of the bill, that about 10 to 15 per cent of the people in this country actually do not get adequate medical service at the present time. The Wagner bill would operate to scrap the entire system which now gives excellent service to the other 85 per cent in order to help a small minority. He predicted that the physicians, themselves, could and would get together to care for the minority without wrecking the system which provides so well for the vast majority. He commended the physicians of Minnesota for taking the lead in finding solutions for their problems here, and declared that the medical and dental professions, if given the chance, would eventually be able to secure the finest medical service in the world, without regimentation, for all the people in the United States.

Looks to Council

Congressman Andresen endorsed the suggestion made by Congressman Karl Mundt of Nebraska that the professions unite forces at once to promote their common purposes in Washington and Dr. Adson pointed to the newly established Council on Medical Care and Public Relations as the instrument through which he hopes that the doctors of the country will unite to work with their colleagues.

It is interesting, in that connection, to note that the new Council on Medical Service and Public Relations created by the House of Delegates of the American Medical Association in June, has already held its first organization meeting and is now engaged in selection of a secretary. Dr. Adson, as a member of that council, will be in a position to bring to it the important deliberations of this conference of congressmen and voters. Physicians in this section will look to it for the leadership so greatly needed by medicine in these times.

INDUSTRIAL SURVEY

The importance of industrial medicine in wartime is generally acknowledged in principle and will be brought home to Minnesota physicians in fact this month when they receive the card questionnaire from the Committee on Industrial Health asking for whole- or part-time volunteers.

The object of the questionnaire is, first, to find out how many physicians are already serving industry in some capacity; second, to create a pool from which industrial needs all over the state can be met by physicians in private practice on a part- or full-time basis.

War has provided an impetus to utilization of medicine in industry which is bound to hold over when the peace comes. For industry, it is opening up new avenues to efficient plant operation. For medicine, it affords a sound new method for extension of preventive medicine within the framework of private practice.

THE MINNESOTA PUBLIC HEALTH ASSOCIATION

E. A. MEYERDING, M.D.
Saint Paul, Minnesota

The Minnesota Public Health Association is a unit of the National Tuberculosis Association. It is a voluntary organization of physicians and laymen, which was organized in 1906 (under the name of the Minnesota Association for the Prevention and Relief of Tuberculosis) to promote through education the early discovery, proper treatment and prevention of tuberculosis. It was incorporated under the laws of Minnesota in 1914.

The Association is supported by the annual sale of Christmas Seals. Ninety-five per cent of the receipts of the Christmas Seal sale is spent in Minnesota to finance specific tuberculosis and health programs in every county and the general statewide program. Five per cent goes to the National Tuberculosis Association to carry on its medical research and the nationwide phases of the program.

The Association is governed by the elected officers and the executive committee, appointed from the board of directors. This board is composed of physicians and laymen and includes representatives of every county and leading organizations in Minnesota.

The executive committee is in intimate contact with the work and passes on all important questions of policy, program and procedure.

The program of the Minnesota Public Health Association conforms to the "Authorized Forms of Tuberculous Work" included in the Christmas Seal contract of the National Tuberculosis Association. The objective is given as follows in the contract:

"The program of the tuberculosis association has as its objective the education of the individual and of the community to the end that tuberculosis may be prevented and adequate provision be made available for diagnosis, treatment and rehabilitation of the tuberculous. Many years of experience in the work of tuberculosis prevention have proved that Seal funds can be used most effectively in this way, thereby accomplishing the greatest good for the greatest number. Seal funds are inadequate for the relief of the tuberculous, or for the permanent support of hospitals, diagnosis clinics, nursing programs and similar activities."

Only the three largest counties of Minnesota, Hennepin, Ramsey and St. Louis, raise sufficient Seal sale funds to have an executive secretary and staff of their own. In all the other counties the officers are volunteers who carry on under the supervision of the state office, which does the clerical work for each county, and aids in organizing the Christmas Seal Sale and in planning and conducting the programs financed by the Seal funds.

The most important work which can be done in the control of tuberculosis is to teach people essential facts about tuberculosis, what causes it, how it is spread, how it can be diagnosed, how it should be treated. The more people are made aware of the simple positive facts about tuberculosis the more the victims of this disease will come in to see their physicians for early diagnosis and treatment.

As scientific knowledge advances, there is increased need to bring new facts to all the people. The Minnesota Public Health Association and its county units carry on a continuous campaign of education using all available media for the dissemination of information. Thousands of people are reached through the schools, through the press, motion pictures, speakers, radio programs, posters, leaflets, charts, exhibits and other avenues of communication. Our publication *Everybody's Health* is widely distributed.

The medical profession is sent regularly abstracts on tuberculosis, and special technical pamphlets such as "Diagnostic Standards and Classification of Tuberculosis."

While hardly a day passes without a newspaper article, a film showing, or some other educational activity, there are two high points each year in the campaign to teach people essential facts about tuberculosis—the Christmas Seal Sale in the winter and the Early Diagnosis campaign in the spring.

Our school health program includes work with the pre-school child by assisting the Minnesota Congress of Parents and Teachers in its Summer Round-up; education of the teacher so that she may in turn train her pupils in ways of healthful living; projects, literature, posters and other materials for schools; health inspection of school children where there are no public health nurses and student tuberculin-testing surveys.

Special projects this year have been scholarships for public health nurses to attend the Tuberculosis course at the Center of Continuation Study, University of Minnesota, and the services of our educational consultant for Teachers' Colleges at their summer schools and work shops.

Tuberculin-testing surveys in high schools, x-ray consultation service, and follow-up service are among the specific tuberculosis activities made possible by Christmas Seal funds. The Minnesota Public Health Association assists in arranging tuberculin-testing surveys to be conducted by local physicians, and if requested by the physicians the Association will send the doctor, who is a part time member of its staff, to give the tests. Through the coöperation of the Minnesota Radiological Society, x-ray consultation service is provided. This service has been of aid in improving and standardizing x-ray technique throughout Minnesota. No Christmas Seal funds are used to pay for x-rays unless the laboratories or individual physicians have sent in a test film. Members of the Minnesota Radiological Society examine these films and make suggestions for improvement of technique when this is necessary. Our free x-ray consultation service is limited to reading films from school surveys and for those known as "medically indigent."

(Continued on Page 840)

MINNESOTA STATE MEDICAL ASSOCIATION

Ninetieth Annual Session

May 16, 17, 18, 19, 1943

Hotel Radisson

Minneapolis, Minnesota

HOUSE OF DELEGATES
Sunday, May 16, 1943

The first meeting was called to order at 2:00 p.m. by Speaker W. W. Will. After an urgent request to the delegates that they report proceedings of the meeting to their respective societies at the first regular sessions following the meeting, the Speaker called for a report from the Credentials Committee.

Chairman F. J. Lexa of the Credentials Committee having reported a quorum present, it was moved, seconded and carried that the reading of minutes of the last meeting be dispensed with and, at the request of the Speaker, Dr. R. M. Kurten of Racine, President of the Wisconsin State Medical Society, addressed the Delegates.

Doctor Kurten: It is always a great pleasure for officers from Wisconsin to be permitted to attend your meeting in Minnesota. We feel we have benefited greatly from these contacts.

This has been a legislative year in Wisconsin. We have been active in stopping undesirable legislation, a job which is often more difficult and more important than promoting new legislation. A few positive things have been accomplished, however. One of them is the passage of a law providing for re-registration of physicians. This law is copied from your system of re-registration and which we hope will enable us to achieve the same high level of control that you have achieved over medical practice. The other is passage in the Assembly of a bill to license nurse-attendants. We have felt that there is a place for the girl trained on a less exacting level than the Registered Nurse who will be able to take care of many needs in rural communities and contribute to the handling of all nursing problems in our hospitals. The bill comes up for action in our Senate this week. We think that if a girl is to give service to the sick, she should be licensed and controlled. Our Council on Nursing Education is given authority in the bill to set the standards of training for these girls.

Another departure of this year involves a closer cooperation between the hospitals and physicians in Wisconsin. We have felt for a long time that hospitals have been permitted to grow away from organized medicine. We have therefore set up a new section in our Association on hospital practice and are giving half a day to discussions on staff and hospital activities, generally, at our meeting.

We have also been very active in Wisconsin in promotion of industrial health activities. We have held a series of meetings throughout the state, bringing in manufacturers, industrialists and physicians, and the first meeting in Milwaukee drew five or six hundred people. It was followed by a program of "trouble meetings" all over the state which have served to bring manufacturers into our Council and to demonstrate to them the importance and usefulness of contact with the medical profession. We are very enthusiastic about the value of our industrial health activities. It is a privilege to be here and I hope to gather much from my visit here. Thank you.

Speaker Will then called for the report of the Chairman of the Council, Dr. W. L. Burnap of Fergus Falls.

Doctor Burnap: The first meeting of the Council in connection with the Ninetieth Annual Session was held at 9:00 a.m. today.

The statement of bank balances was presented and it was moved that any cash surplus on hand be turned over to the Finance Committee of the Council to be invested as the Committee sees fit. Seconded and carried. The statement of budget balances was accepted as presented with the addition of $5,500 to the budget of the Committee on Public Policy.

Applications for Affiliate Membership for Doctors Sigfred Engh of Jackson and C. G. Sutherland of Rochester were approved and it was moved, seconded and carried, also, that the Council recommend election of Doctor Kathleen Jordan of Granite Falls as an Associate Member of the Association.

It was moved, seconded and carried that the Council recommend endorsement by the House of Delegates of a resolution for establishing a Committee on Medical Service of the American Medical Association. Also that the House of Delegates instruct the Delegates to the American Medical Association to introduce the resolution and support it at the meeting of the House of Delegates of the American Medical Association in Chicago in June.

At the request of the Woman's Auxiliary, the Council gave its endorsement to *Hygeia* as a health magazine and urged that it be given wider distribution.

Recommendations of the special committee appointed to consider the program of medical, hospital and nursing care for expectant wives and sick infants of enlisted men in active military service was presented and, after considerable discussion, referred back to the Committee for further study. Another report is to be made to the Council Monday morning, May 17.

The following amendment to Chapter 5, Section 11, of the By-Laws was presented and approved by the Council.

"All bonds stocks, mortgages, contracts, notes, debentures and other negotiable instruments, and all other personal property of every nature whatsoever that may be owned or held by the Association may be sold, transferred or assigned in accordance with the order of the Council or of the Finance Committee of the Council. The Chairman of the Council or President of the Association, and Treasurer or Secretary or Executive Secretary are empowered to, and shall, execute such instruments of sale, transfer, or assignment as may be necessary to effect or consummate any such sale, transfer or assignment."

It was moved, seconded and carried that the report of the Chairman of the Council be accepted.

Speaker Will then called for the report of the Reference Committee on Medical Education Reports, Dr. A. H. Sanford of Rochester, Chairman. The following reports were considered:

COMMITTEE ON CANCER

Lay education about the importance of early diagnosis and treatment is now soundly established and constantly expanding through the Minnesota Society for the Control of Cancer and its Women's Field Army. The Committee on Cancer has worked closely with this organization in developing its program, supervising its methods and educational matter and guiding its policies.

Unusual impetus to this work was given by the education

course for lay workers arranged at the University Center for Continuation Study recently under sponsorship of the University, the Cancer organization and the Committee.

Minnesota is also making an important contribution to fundamental knowledge of malignancy through the coöperative project in Cancer research now being carried on at the University by Maurice Visscher, R. G. Green and J. J. Bittner. The importance of genetic factors in malignancy is being studied and also the rôle of such agents as the milk influence. The project is supported by what is known as the Child Fund granted by the State Legislature and it should be noted to his credit that Governor Stassen made a special request to the Legislature to set aside an appropriation for this important work this year.

On the level of treatment, there is also a new development in Minnesota about which all physicians need more information. That is the hospital for incurable cancer patients, called Our Lady of Good Counsel Free Cancer Home, located at 2076 St. Anthony Avenue, Saint Paul, and operated by an Order of Catholic Sisters. Care in this excellent institution is free to any hopeless cancer patient who needs it, regardless of creed or race, but physicians seem largely unaware of its existence. They are urged to make use of it for their patients anywhere in Minnesota or neighboring states.

M. W. Alberts, M.D., *Chairman*

COMMITTEE ON CONSERVATION OF HEARING

This committee has held two well-attended meetings during the past year. At each it was the consensus of opinion that its activities should be continued as a part of the war effort to promote better health conditions related to preserving the hearing of the school child.

With the coöperation of interested physicians, a bill was carefully prepared "For an Act Relating to Children with an Impaired Sense of Hearing and Authorizing the State Board of Health and Local Boards of Education to Institute a Statewide Program for Their Selection and Making an Appropriation Therefor."

This bill was endorsed in principle by the Council a its meeting February 28, 1943, and received the support of interested members of the State Legislature and others. The Council at its meeting in recognition of the importance of creating public awareness of the need of more effective work in this field of preventive medicine through educational effort, generously appropriated $450.00 to help meet the Committee's expenses during the present fiscal year.

Your Committee reports an encouraging growth in interest in the conservation of the hearing of school children recently manifested by national and local medical, educational, public and school health and parent-teacher groups. The development of improved technics and the adoption of practical standardized procedures for the discovery of hearing-deficient school children has created a greater demand for the leadership of members of the medical profession of Minnesota in initiating a practical state program.

Horace Newhart, M.D., *Chairman*

COMMITTEE ON FIRST AID AND RED CROSS

This Committee has considered the state law requiring school buses to be equipped with suitable splints and first-aid kits. The Minnesota Department of Health does not wish to be responsible for enforcement of this law, especially since funds were not allotted for that purpose. The Department of Education is willing to take the responsibility of enforcing the law. This Committee, therefore, urges that steps be taken leading toward transference to the Department of Education of the aforesaid responsibility. The question of teaching of first aid under the law, and the question of the type of splints to be supplied, are problems concerning which as yet there has not been sufficient experience to support a decision as to what is the best plan to follow. This Committee, however, is more than willing to coöperate in solution of both problems if its help is needed. Moreover, the Committee feels that it should be available in an advisory capacity in matters pertaining to the agency responsible for enforcement of the law.

This Committee has considered the question of first aid from many points of view and feels that one of the principal ways in which it can he of value is to make people accident-prevention conscious. The Committee is stressing this point of view in its 1943 exhibit and in general contacts.

The Committee wishes to have information concerning how many physicians in the state teach first aid and how many man-hours they are putting in on such work; for example, how many hours they devoted to it in 1942. The Committee would like to know approximately the number of people who have received instruction from the physicians and whether the classes given were of junior, standard, advanced or instructor's grade, or all four. The Committee has many uses for this information and hopes that its request for the data will he approved.

The Committee has communicated with the Mid-Western Area Headquarters, in St. Louis, and has offered its coöperation. Also, the Committee has invited Dr. G. Foard McGinnes, Director, Medical and Health Service of the American Red Cross, and Mr. Rohert F. Eaton, Director of First Aid and Water Safety, to attend the meeting of the Committee on May 18, 1943, for a discussion of joint coöperation. It is the intention of the Committee to communicate with the various medical societies in the state, especially the county and district medical societies, in order to offer assistance if any is needed in connection with First Aid and Red Cross Activities.

"The members of the First Aid and Red Cross Committee were unanimous in the belief that, because of the urgency of the present situation, the standard Red Cross First Aid Textbook be followed in teaching First Aid. It was agreed also that, in order to avoid confusing the students, the book would be followed just as it is, without expression of the instructor's personal disagreement with the text." The foregoing is quoted from the 1942 report of this Committee.

John S. Lundy, M.D., *Chairman*

COMMITTEE ON HEART

Nothing has developed this year requiring any action by the Heart Committee.

The Committee has held no meetings and has no report to make to the House of Delegates.

F. J. Hirschboeck, M.D., *Chairman*

COMMITTEE ON MEDICAL EDUCATION AND HOSPITALS

The past year has been one of major adjustments for both medical education and hospitals to the war situation. In June, 1942, the Medical School of the University of Minnesota adopted an accelerated program of medical education with the discontinuance of summer vacations and the concentration of the four-year medical curriculum into three calendar years. At the same time the number of students accepted in the freshman class was increased by approximately 10 per cent. Both of these actions were taken in the interest of the war effort in order to graduate as many physicians as possible in the shortest time.

For the same reason the requirements for admission to the Medical School have been reduced for the duration of the war to two years of college work. All of these adjustments involve certain sacrifices in the quality of premedical and medical education, but the sacrifices are not serious and are clearly in the interests of the war effort.

Medical students and premedical students who are accepted for admission to the Medical School are given deferment of military duty either by appointment, on an inactive status, in the Army or the Navy or by deferment by Selective Service. On about July 1, 1943, these students who are physically qualified will be placed on active duty in the Army or the Navy and assigned to continue their education under the Army or the Navy Specialized Training Programs.

The two Army hospitals for which the Medical School provided the professional staff are hoth on foreign service: U. S. General Hospital No. 26 in Africa and U. S. Station Hospital No. 31 in New Caledonia. The loss of faculty members to these hospital units as well as to the general medical corps of the Army and the Navy at the time that the Medical School has its heaviest teaching load in history is creating difficult problems in the maintenance of an adequate teaching program. By careful planning, increasing the teaching loads, and other readjustments, however, it is still possible to maintain medical teaching on a satisfactory level with the staff which has been listed as essential by the Medical School and approved by the Procurement and Assignment Service.

Hospitals also are facing serious and increasing difficulties as a result of the war. Losses of visiting and resident staff, physicians, nurses, and employes to war service or war industries are becoming critical in many institutions. Added to this there are shortages of critical materials and financial problems occasioned by necessary increases in salaries and increases in prices of both supplies and equipment. To meet these situations, hospitals are making many adjustments which will enable them to continue to render adequate medical care even though some of the refinements and luxury aspects of hospital care must be sacrificed for the duration of the war.

Harold S. Diehl, M.D., *Chairman*

COMMITTEE ON PSYCHOPATHIC PERSONALITIES

There were no meetings of the Committee on Psychopathic Personalities during the past year.

G. R. Kamman, M.D., *Chairman*

COMMITTEE ON PUBLIC HEALTH NURSING

Probahly due to the war, puhlic health activities in general, and public health nursing especially, have progressed in the State of Minnesota.

A large number of nurses are now engaged in industrial work. Your Committee had some discussion as to the need of formulating standard policies for this group, but after discussion with several industrial physicians, it was not believed feasible at this time.

The University of Minnesota, School of Public Health, in addition to its regular course for public health nurses, is graduating Junior Puhlic Health Nurses whose course consists of two months of field work and four months didactic course at the University. This type of graduate is in definite demand since many counties, who had none before, are now employing public health nurses. Because of this increase, the Chairman of your Committee, together with representatives of the State Board of Health, and a committee of the Minnesota Organization of Public Health Nursing, met and revised the suggested policies which have been in use since 1940. This revision is being submitted to the Public Health Nursing Committee of this Association during this meeting and will be suhmitted to the Council for approval at an early date.

C. A. Scherer, M.D., *Chairman*

COMMITTEE ON TUBERCULOSIS

Request of Council

At the August 21, 1941, meeting, the Council of the Minnesota State Medical Association asked the Committee to make a careful study of the tuberculosis problem in Minnesota and formulate an adequate program for the control of this disease. The Committee has continued to take this responsibility seriously and has devoted a large amount of time and effort to the development of such a program.

Committee Program Published

In October, 1942, MINNESOTA MEDICINE published the material assembled by the Committee under the title of "The Tuberculosis Program of the Minnesota State Medical Association." Several thousand reprints were procured for the State Association office and the Minnesota Public Health Association, which are available for distribution. Already there has been a considerable demand for these reprints from physicians in other states.

Tuberculosis in State Institutions

Surveys made by Doctors Burns and Hilleboe revealed that approximately 10 per cent of patients in the institutions for the mentally ill have clinical tuberculosis. Approximately 1,700 patients from these institutions are on parole at all times. Moreover, many relatives and friends visit patients in the institutions. The members of the personnel are working under a serious hazard; therefore, the Committee made the following recommendations to the Council in December, 1942:

1. That the tuberculous insane be segregated in one institution, where they can be treated both for the mental and the tuberculous conditions.
2. That members of personnel and inmates of all state institutions be examined on employment or admission and reëxamined at least annually, and that all who are found to have tuberculosis be transferred immediately to the appropriate institution.
3. That this segregation be arranged without reducing in any way the bed capacity in our sanatoriums for the tuberculous.

Personnel of School Systems

Control of tuberculosis among the personnel of school systems was discussed. The American School Health Association has appointed a subcommittee on tuberculosis for the State of Minnesota consisting of Drs. L. S. Jordan, S. A. Slater, and E. A. Meyerding, Chairman. This subcommittee has prepared some standards by which individual schools or whole school systems may be accredited or certified by the national organization. This is in harmony with the county accreditation program in Minnesota.

Examinations for Those Entering Military Service

In our last report attention was called to the inadequacy of examinations for tuberculosis of those called by Selective Service. Since that time such examinations have been taken over by the military authorities. Unfortunately, our most delicate phase of the examination, namely, the tuberculin test, has been omitted. X-ray film inspection is done by photofluorograms—35 millimeter by the Navy and 4 by 5 inch films by the Army They are serving a useful purpose in screening out persons with gross pulmonary pathology. The most unfortunate fact concerning the x-ray work, to date, is that persons who interpret the films are compelled to make etiological diagnoses from shadows. It has long been known that this is a physical impossibility and its present practice by our military authorities has caused much unpleasantness among inductees, their families, and their physicians. Major Robert Radl is now developing a plan which should aid in the solution of this problem.

At its meeting on March 26, 1943, the Committee unanimously voted to recommend to the Council that tuberculosis among rejected inductees be made the subject of one of the regular packets of the month of the Minnesota State Medical Association.

Incorrigible Tuberculosis Carriers

The incorrigible tuberculosis carrier was discussed at several meetings and it was finally decided to recommend to the Council that a place be provided on the grounds of one of the sanatoriums where incorrigible patients can be committed and retained as long as the need exists. Here these individuals would receive the best known treatment and would be discharged whenever the attending physician found that they were no longer public health menaces. From fifteen to twenty-five beds were considered adequate for this purpose.

Study of Minnesota Sanatoriums

A questionnaire was sent to the medical directors of each of the sanatoriums in Minnesota, all but two of whom responded. In these institutions there were 1,872 beds with 250 vacancies and forty-three on the waiting list on January 1, 1942, making a total of 207 unoccupied beds on that date; in other words, about 11 per cent of the beds were vacant. The Medical directors of our sanatoriums are of the opinion that about 6 per cent of the beds should be vacant at all times in order to give immediate service to emergency cases and to remove promptly from the communities all contagious cases when they are discovered. Most of the medical directors reported that where vacant beds exist, enough new patients would be found to occupy all of them and a waiting list would be created if a careful search were made for cases throughout the district.

On January 1, 1942, there was a shortage of six staff physicians in our sanatoriums. This apparently was created, in part, by physicians leaving for military service.

From this survey and other available information, the Committee on Tuberculosis is strongly of the opinion that we do not have too many sanatorium beds in Minnesota. The Meeker County demonstration and the Induction Center at Fort Snelling are good examples of finding cases of clinical tuberculosis among apparently healthy persons; indeed, when our state-wide campaign gets under way, it is doubtful whether there now exists enough sanatorium beds for all of the individuals who need this kind of treatment.

Certification of Sanatoriums

From the questionnaires and other information concerning our sanatoriums, the Committee is of the opinion that excellent clinical work is being done, and that most of the medical directors and their staffs are engaged in finding new cases of tuberculosis in their districts and in following up the discharged cases.

The State Medical Association, as such, has not exhibited much interest in our sanatoriums. After careful consideration the Committee recommended to the Council that the State Association issue certificates of recognition to those institutions which meet certain standards. Owing to difficulties incident to the war, the standards were made quite general but consistent with first-class work. The Council approved this project and a certificate form was prepared to be presented to the institution at an annual meeting when the County Commissioners are present, together with the physicians of the district.

Tuberculosis Exclusion Examination in General Hospitals

It has been estimated that approximately 40,000 cases of pulmonary tuberculosis enter the general hospitals of this country annually, most of whom are admitted for other conditions. Their tuberculosis is not detected unless a special examination is made. Many of these individuals spread tubercle bacilli to fellow patients and to members of hospital personnel. A subcommittee consisting of Drs. K. H. Pfuetze, S. A. Slater, A. J. Henderson, Sumner Cohen, and H. C. Hinshaw has been appointed to prepare recommendations for solution of this problem.

The Meeker County Project

Accomplishments.—The physicians of Meeker County have continued with their splendid project of administering the tuberculin test to all citizens, making x-ray films of the chests of the reactors, completely examining those with x-ray shadows which might be due to tuberculosis, and treating or isolating those found to have clinical tuberculosis. To date, 7,500 persons have received the test. This is more than one-third of the entire population. Of those tested, 22 per cent reacted, and seventeen cases of clinical tuberculosis have been found, most of whom were not previously suspected of having tuberculosis.

The physicians of Meeker County have demonstrated a spirit in the control of this contagious disease which, to this date, probably could not be duplicated in any other county in the nation. They have set an example and we believe that the same spirit will prevail among the physicians of many Minnesota counties in the near future.

Local Physicians Self-Sufficient.—The physicians of Meeker County have demonstrated that they are self-sufficient in the conduct of every phase of tuberculosis activities, including diagnosis, treatment, and prevention. They have become among the best informed physicians on this disease in the state and they are now in a position to offer advice and to make recommendations to the physicians of any county in Minnesota.

Procurement of Funds.—For many months after the Committee and the local physicians decided upon the Meeker County demonstration, no funds were available. The State Medical Association came to the rescue by providing $1,000.00. This was followed by a $1,000.00 grant from the Minnesota Public Health Association. Later, the National Tuberculosis Association contributed $1,000.00. On the suggestion of Dr. William F. Braasch, the Committee applied and received a grant of $1,000 from the Research Committee of the American Medical Association. During the year, the Meeker County Public Health Association donated $500 to this work.

On December 18, 1942, Mr. and Mrs. J. W. Bryant of Minneapolis donated $500. This is the first private donation received by the Committee. Mr. Bryant is foundry manager at the Northern Pump Company. The Committee honored itself by unanimously electing Mr. and Mrs. Bryant to honorary membership.

Publicity.—Throughout the year attention has been called to the Meeker County project in numerous medical and newspaper articles.

Accreditation of Counties

In the report of last year a plan for accrediting counties with reference to tuberculosis was described. The plan was approved by the Council, the State Department of Health, and Governor Stassen. The qualifications consisted of: (1) an average mortality rate over the past five years of 10 or less per 100,000; (2) tuberculin testing of at least 80 per cent of all the seniors in the high schools of a county with the incidence of reactors not to exceed 15 per cent. Two counties already had been accredited; Lincoln County on December 11, 1941, and Olmsted on May 22, 1942.

This year, Murray County qualified with a mortality rate over the past five years of 9.4 per 100,000. Ninety-six per cent of the seniors in the high schools were tested and only 5.2 per cent reacted. The accreditation ceremonies were held in Slayton, Minnesota, on the evening of August 28, with Governor H. E. Stassen as banquet speaker.

Stevens County also qualified this year with an average five year mortality rate of 9.2 per 100,000 population. Approximately 7 per cent of the high school students in the senior class reacted to tuberculin. Because of difficulties incident to the war, it was decided to present this certificate at one of the meetings of the Committee, April 20, 1943. Dr. F. W. Behmler of Morris accepted it.

Two other counties have qualified for accreditation by the mortality standard: Rock County had an average mortality rate of 9.1 and Martin County 7.4 over the past five years.

Committee Addressed by Colonel Long

Lieutenant Colonel Esmond R. Long recently placed in charge of the tuberculosis work of the United States Army accepted our invitation to meet with the Committee in the Lowry Hotel in St. Paul on April 20, 1943. A number of physicians and others interested in tuberculosis were invited as guests.

Minnesota Department of Health

The Committee has tried to coöperate in every possible way in supporting the program of Dr. A. J. Chesley and his staff. Dr. Chesley and his staff have supported the program of our Committee in an ideal manner.

Legislation

This year a number of bills pertaining to tuberculosis were introduced in the State Legislature by physicians. It seems somewhat unfortunate that the Committee on Tuberculosis of the State Medical Association was not made aware of a single bill by the authors. The members of this Committee represent all phases of tuberculosis work throughout the State and it would seem no more than reasonable that any physician who desires to introduce a bill for legislative action would want to have it approved first by this Committee, then by the Council, and finally by the State Medical Association.

Interest of Governor Stassen

Governor Stassen has manifested great interest in our work. He drove to Slayton, Minnesota, to participate in the Murray County accreditation ceremonies. His address at that meeting manifested an unusual knowledge of the subject and a clear vision of the control of tuberculosis throughout the state. The members of the Committee feel extremely fortunate in having had such splendid support of the State's Chief Executive.

J. A. Myers, M.D., *Chairman*

COMMITTEE ON VACCINATION AND IMMUNIZATION

The program of the Committee on Vaccination and Immunization has been carried forward by community programs in many parts of the state.

Protection against wartime epidemics is an important phase of Civilian Defense, generally, and a fundamental objective of the public program of organized medicine.

Every member is urged to assume responsibility for the protection of his own patients and for the organization and operation of community projects to the end that no child may be allowed to go unprotected in Minnesota.

The Hennepin County Medical Society, in coöperation with Civilian Defense, labor organizations and many welfare groups, is now concluding a highly successful effort to vaccinate the citizens of Minneapolis. It is estimated that approximately 1,200 patients a day applied to their own doctors for vaccination during the height of the campaign. Many commercial firms and hospitals organized programs for their own personnel. A series of low-cost clinics to be established shortly in the city's neighborhood houses will finish the campaign.

Posters and leaflets to aid in such projects are available at the State Office for both vaccination and immunization. Members are urged to make use of them.

Attention is called to the packet on Immunization, subject-of-the-month for November, which outlined completely all acceptable immunization procedures and emphasized the importance of routine protection against smallpox and diphtheria in wartime. Also to an article called "Prophylaxis," briefly covering the same material, which appeared in January, 1941, in the *Hennepin County Bulletin* and which should be republished in Minnesota Medicine for wider publicity among the medical profession.

E. J. Huenekens, M.D., *Chairman*

Doctor Sanford: We approve the report of the Committee on Cancer and recommend its acceptance by the House of Delegates. We wish to call attention, particularly, to the free Cancer Home, noted in the final paragraph, which is operated for hopeless cancer patients, regardless of race or creed, by an Order of Catholic Sisters in St. Paul. Also to an activity in support of the April Cancer campaign in Hennepin County which is not mentioned in the report. The Hennepin County Cancer Committee held a tea at the home of Dr. and Mrs. Russell Morse to open the campaign and the Auxiliary, under the direction of Mrs. Harold Wahlquist, was active in the work.

We approve the report of the Committee on Conservation of Hearing and recommend its acceptance. We regretfully report, however, that the bill mentioned in Paragraph Two of the report failed to pass the Legislature because of lack of understanding of the problem involved and because it carried a small appropriation for the purpose of initiating a state-wide program. This failure should greatly stimulate members of the State Association to acquaint the medical profession, educators, members of parent-teacher associations, welfare and other organizations with the need and large possibilities in this field of preventive medicine and educational adjustment. It is the recommendation of your committee that increased prominence be given to this subject in programs of state, local, and district medical and education organizations and that demonstrations, surveys and exhibits, illustrative of the technique of detection be encouraged to stimulate interest in inclusion of standardized procedures in school programs for children, threatened or handicapped with hearing loss. Legislation will follow such an effort as has already been the case in many states.

We approve the report of the Committee on First Aid and Red Cross and recommend its acceptance by the House of Delegates. Also the reports of the Heart Committee, the Committee on Hospital and Medical Education, the Committee on Psychopathic Personalities, the Committee on Public Health Nursing, the Committee on Vaccination and Immunization, and the Committee on Tuberculosis. The Reference Committee commends most highly the activities of the Committee on Tuberculosis and wishes to call especial attention of the House of Delegates to the Meeker County project.

* * *

Five minutes being allotted to each Committee Chairman who desired to discuss the report of his Committee, the Speaker called on chairmen of the above committees and Dr. Newhart responded as follows:

Doctor Newhart: The bill to introduce a program for children handicapped by hearing loss failed because the public, including ourselves, the medical profession of this state, are not sufficiently well informed as to the importance and possibilities of accomplishment in this field. Your Committee especially recommends that we give it all the consideration we can for it represents a tremendous gap in our efforts to take care of the exceptional child and the children of the future.

I want to announce for your encouragement, as well as my own, that for the past year the American Academy of Ophthalmology and Otolaryngology representing 3,800 members has assumed large responsibility for carrying out a national education campaign in this field by which it can help state organizations. Also I want to call attention to the unusual sound film in color to be shown Tuesday at 3:00 p.m. This film will be available for use during the summer and fall among educators and others, we hope. It will inspire you, I think, with a greater desire to carry the idea of this need in your respective communities. Thank you.

It was moved, seconded and carried that the Report of the Reference Committee on Medical Education Reports be accepted.

The Speaker then called for the Report of the Reference Committee on Miscellaneous Reports, Dr. C. A. McKinlay of Minneapolis, Chairman. The following reports were considered:

COMMITTEE ON CHILD HEALTH

Members of the Committee on Child Health served on a special committee of the State Medical Association to consider the proposal of the United States Children's Bureau relative to obstetric, pediatric, and hospital care of the wives and infants of men serving in the armed forces of the nation. Because of changes

in the original plan of the Children's Bureau, this Committee has continued to be active.

A second postgraduate course in pediatrics was conducted at the Center for Continuation Study at the University of Minnesota by the department of Postgraduate Education and the Division of Maternal and Child Health of the State Board of Health in accordance with recommendations formulated by this Committee and approved by the Council last year. Coöperative effort with Health and Summer Round-Up Committee of the Minnesota Congress of Parents and Teachers was the theme of the round table discussion at the final session.

The activities of the P.T.A. ommittee in this work are entirely educational in nature and are aimed at having every child examined by his physician to discover and correct remedial defects before the child enters school. That the courses presented in 1942 and 1943 are highly desirable and that they have borne fruit is attested to by the fact that the physicians in attendance have been given valuable instruction in the latest diagnostic and therapeutic measures and that their own discussion of the problem indicates a growing awareness and knowledge of its requirements and solution.

The splendid coöperation exhibited by the Department of Postgraduate Education of the University and by the State Board of Health merit recognition by this Committee and the membership of the State Association.

The Chairman of this Committee discussed the subject of "Child Health in Wartime" before the County Medical Officers at their meeting on February 27, 1943.

The Chairman has also coöperated with the President and Executive Secretary in arranging for a section of the program for the Annual Meeting of the State Association which will be devoted to the presentation of subjects relating to child health in wartime.

The work of the type that this Committee on Child Health is doing, and particularly such work as insures a continuation of programs of preventive medicine, has been a matter of prime consideration in the American Academy of Pediatrics. Although the annual meeting of the Academy has been cancelled because of the war situation, nevertheless the state chairman of the Academy will meet to consider ways and means of continuing this work.

R. L. J. Kennedy, M.D., *Chairman*

COMMITTEE ON MATERNAL HEALTH

Through a sub-committee known as the Minnesota Maternal Mortality Committee, a comprehensive study is being made of all factors relating to maternal deaths which occurred between July 1, 1941, and June 30, 1942. There were 112 maternal deaths, which we believe includes every death of a woman in or connected with the puerperal state during the above-mentioned period.

The investigation has been conducted by trained obstetricians and consisted of personal interviews with those connected with each case and the examination of all records at first hand. The information thus obtained in each individual maternal death was analyzed, studied and criticized by the Maternal Mortality Committee. In each case, preventability of death and assignment of responsibility was determined by the Committee as a whole.

A brief preliminary statement of the general report of this Committee follows:

There were 112 maternal deaths; seven of these were not reported to the Bureau of Vital Statistics but were found by matching the Birth and Death certificates. The maternal death rate as determined from only the death certificates for the full year represented by this study would have been understated by 6.25 per cent had not the Birth and Death certificates been matched.

All of the patients were residents of the State of Minnesota except for two who lived in Wisconsin.

The Final General Report of this Committee will contain detailed charts and information on each of the following:

1. Source of Reporting of Maternal Deaths
2. Race of Patients
3. Age of Patients
4. Legal Residence
5. Marital Status
6. Place of Delivery
7. Place of Death
8. Parity
9. Duration of Pregnancy
10. Attendant at Delivery
11. Condition of Patient when first seen.
12. Consultations
13. Position and Presentation
14. Outcome to child
15. Type of Delivery
16. Operative Procedures
17. Pelvic Mensuration
18. Prenatal Care
19. Care in Labor and Delivery.
20. Postpartum Care
21. Blood Wassermann
22. Length of Life after Delivery
23. Preventability of Death including placing of responsibility.
24. Primary or Immediate Cause of Death as determined from the Study and Irrespective of Death Certificate.

Certain types of cases such as the Toxemias, Hemorrhagic states, Infections, Abortions and non-obstetric complications will be studied as a group and separate reports will be presented for each group.

Although the Maternal Mortality Committee has acted simply as a fact finding organization, it is hoped that certain definite suggestions and recommendations may be presented to the Minnesota State Medical Association and to the State Board of Health when the final reports are completed within the next three months.

Russell J. Moe, M.D., *Chairman*

COMMITTEE ON OPHTHALMOLOGY

A survey of the visual health of the school children of Rural Hennepin County was started in April, 1942.. The expenses of this survey were jointly shared by the Minnesota State Medical Association and the Minnesota Society for the Prevention of Blindness. The project was carried out by these Societies with the help of the Hennepin County Medical Society and the Public Health Nursing Agencies, and was approved by the Minnesota Academy of Ophthalmology and Otolaryngology.

The schools were chosen according to geographical distribution, and were balanced as to income groups. The County Health nurses conducted a visual acuity examination in all the chosen schools to detect those children with visual acuities of 20/25 or less, or those having ocular symptoms. The total enrollment of the chosen schools was 4,443, of which number 1,283 or 28.87 per cent required examination, and of these 184 or 4.15 per cent were not examined because of refusal of the parents to allow the examination.

The examinations were conducted by Drs. J. H. Crawford and A. H. Downing of the University of Minnesota Hospital Staff, assisted by the Hopkins' School Nurse, the county nurses, and two lay women who assisted the doctors each day.

The total number of children examined was 1,099 or 24.7 per cent. Refractive errors composed the principal condition and refraction was immediately advised for 561 or 51.04 per cent of those examined or 12.87 per cent of the total enrollment. Another group of 127 children or 2.9 per cent of the total enrollment was scheduled for another vision test in 6 months, and then refraction if necessary. Thus making a total of 688 cases or 62.54 per cent of the examined group or 15.77 per cent of the total enrollment that required refraction or further examination.

Of 513 children with normal visual acuity, but with complaints possibly of ocular origin who were examined, 344 or 7.68 per cent of the total enrollment, no treatment or refraction was advisable, whereas, in 169 or 3.8 per cent of this enrollment, further treatment or refraction was deemed advisable. Of the group having visual acuities of 20/30 or less only 18 or 1.6 per cent of total enrollment did not require any treatment, or any further treatment. (Some were under the care of oculists.) Of the 1,099 cases, only 1,086 were suitable for analyses.

An effort was made to provide treatment for all patients in need of it. A summer follow-up program was carried out by the Hopkins school nurse in June in the Hopkins, Harley-Hopkins and Glen Lake districts.

The survey showed a significant trend in the incidence of hyperopia in Groups "A" and "B." This followed a descending curve from 30.6 per cent of those born in 1935 to 4.76 per cent of those born in 1924.

The incidence of refractive errors of all the children examined revealed the following figures. Those in Group A are children with virtually normal visual acuity; Group B are children with moderately impaired visual acuity, and Group C are children with obviously marked visual impairment.

	Group A	*Group B*	*Group C*
Hyperopia	39.6 %	30.8%	11.9%
Hyperopic astigmatism	18.9%	19.4%	8.65%
No marked refractive error	24.17%	8.%	1.6%
Myopia	5.23%	23.2%	46.0%
Myopic astigmatism	2.22%	4.15%	9.0%
Mixed astigmatism	2.81%	5.88%	3.0%
Low mixed errors	7.24%	8.32%	11.3%

The distribution curve for myopia in Group "C" shows definitely the increased incidence with age. In this group 2.36 per cent of those born in 1935 were afflicted with myopia, while 19.0 per cent of those born in 1924 were found to be myopic.

The survey showed a correlation of 16 cases of convergent strabismus to one case of divergent strabismus. Amblyopia, chiefly amblyopia ex anopsis accompanying or following strabismus was found in 27 cases. Other pathology found included 11 cases of marginal blepharitis, 5 of hordeolum, 4 chronic conjunctivitis, 10 of diseased tonsils and adenoids besides isolated cases of multitudinous conditions.

The survey attempted to correlate such findings as symptoms; school progress, physical condition, home environment, source and reliability of glasses with the eye findings. Numerous data and charts accompanying the final report give much information. Finally suggestions are made, which will facilitate and improve any further work of this kind.

At the 1942 meeting of the Minnesota State Medical Association at Duluth, the members of the Committee on Ophthalmology recommended refraction courses, which may be given by the University of Minnesota for the benefit of the general practitioner. Such a course is being given at the Continuation Center for Study, at the University of Minnesota from May third to May eighth.

T. R. Fritsche, M.D., *Chairman*

COMMITTEE ON DIABETES

Because of the restrictions in travel, it has been impossible to carry out the plan formulated at the last year's meeting of the Committee to have regional meetings with the county medical societies.

At last year's meeting it was suggested that all members of the state committee on diabetes become members of the American Diabetic Society. They all coöperated splendidly and now all are members.

Food rationing has presented a problem and an easier method than that employed at present is now being sought through the OPA. We hope to have definite word on this problem by the time of the state meeting in May.

JOHN R. MEADE, M.D., *Chairman*

COMMITTEE ON FRACTURES

The war, with its great stimulus to first-aid training, has established in the minds of many laymen as well as officials, the importance of proper first-aid handling of fractures, including use of the standard splints.

The proper splinting of all fractures at the scene of the accident, which has been one of the objectives of this Committee for many years, is therefore on the way to realization. All members are urged to foster interest in teaching of standard first aid for frature cases.

War has also contributed largely to our methods of handling many fractures when they arrive at the hospital or field station for treatment.

These new methods will be demonstrated in the course of the fracture symposium arranged for the first session of the Annual Meeting program. Attention of all members is called to this program.

V. P. HAUSER, M.D., *Chairman*

HISTORICAL COMMITTEE

Beginning in January, 1938, and continuing to date, twenty articles have been published in MINNESOTA MEDICINE; the following list of articles has appeared during the year 1942:

History of the Minnesota State Medical Society

A psychiatric bulletin in Minnesota of half a century ago; A chapter of psychiatric journalistics
Pioneer physicians of Martin County prior to 1900
The Asiatic cholera in Saint Paul
History of medicine in Dodge County (in publication)

There are in hand eleven articles of major importance and ten of less significant historical bearing, as reported last year

Additional material received by the Chairman which is available for publication is as follows:

Notes on the Minneapolis Academy of Medicine
Biographical notes on pioneer physicians of Pope County
Medicine in Redwood County 1865-1942
Douglas County Physicians before 1900
Watonwan County medical history
Medical history of Otter Tail County
Alexander J. Stone, M.D., LL.D.
Miscellaneous detached notes for incorporation in the final county narratives.

A portion of the unpublished material in the preceding lists is practically ready for publication in MINNESOTA MEDICINE; much of it would be more suitable for the Section on the History of Medicine if it were expanded and revised editorially.

The replies to an inquiry on the progress of historical research in the state sent out last year have been brought up to date and condensed as follows:

The narratives for Stearns and Benton Counties are reported as in progress. The histories for Martin and Faribault Counties (Blue Earth Valley Medical Society) are in preparation, and histories for Swift and Meeker Counties have been promised.

The history for Dodge County is now in publication, and to this article special attention is called because of the thoroughness of its preparation and the amount of historical detail which it contains,. The narrative for Houston County is ready for release; that for Fillmore County is being written, and that for Olmsted County is in hand.

Investigators are reported as working in Cottonwood, Jackson, Murray, Nobles, Pipestone and Rock Counties (Southwestern Minnesota Medical Society), and in Big Stone, Pope (notes are in), Stevens and Traverse Counties (West Central Minnesota Medical Society), in Chippewa County, and work is in process of organization in Aitkin, Beltrami, Cass, Clear Water, Crow Wing, Hubbard, Koochiching, Morrison, Todd and Lake of the Woods Counties (Upper Mississippi Medical Society).

The Chairman of your Committee urges that the members of the Committee serve actively in their respective regions of the state to stimulate the work of historical research and to bring it to completion.

From expressions of interest at the Historical Booth in the Armory in Duluth last year, it seems that a questionnaire from the State Association would stimulate many persons to write reports with more complete historical data who otherwise would not act.

Your Committee recommends:

1. That collection and preparation of historical material continue steadily, so that when the national emergency is over, publication of the book. *The Pioneer Medical History of Minnesota,* may proceed without loss of time.
2. That in anticipation of publication, steps be taken to secure an editor to correlate the material in suitable form.

The loss of the capable and energetic chairmanship of Dr. John Armstrong becomes more keenly realized as the work of your Committee progresses.

M. C. PIPER, M.D., *Chairman*

COMMITTEE ON MEDICAL TESTIMONY

During the past year the Medical Testimony Committee had several verbal complaints regarding medical testimony given by members of our Association. In not a single instance was the complaining physician willing to submit his statement in writing in spite of the fact that he was told that his name would be kept confidential by the Committee. This lack of coöperation by our members of the Minnesota State Medical Association definitely handicaps the activities of our Committee. It not only prevents the Committee from making the necessary investigations, but, and which is more serious, encourages the few physicians in this State to continue with unethical and questionable testimony.

During the past year serious charges were preferred, in writing, from some one of our neighboring states, against one or our own members regarding his expert medical testimony in the courts of that state. Your Committee, with the able assistance of three specialists in the particular field involved, carefully reviewed the entire testimony. After a thorough study, it was unanimously decided that the testimony was of such a serious and questionable character that the complete report should be referred to the State Board of Medical Examiners. This was done, and a detailed investigation was conducted by the State Board of Medical Examiners. Our Committee was informed that the accused physician was severely reprimanded and advised that continuance of that type of medical testimony would result in disciplinary action being taken.

During the recent winter and spring sessions of court in this state, not a single complaint regarding medical testimony has been made verbally or otherwise to any member of our committee. If this means that the members of the State Medical Association are not sufficiently interested to bring the level of medical testimony to its highest standard, it is very discouraging. If on the other hand, it signified that there has been a definite improvement in medical testimony in the courts of our state, our State Medical Association is to be highly congratulated.

On January 12, 1943, the Chairman of our Medical Testimony Committee was invited to address the Fifth Annual Congress on Legal Medicine and Legislation and on Industrial Health of the American Medical Association at Chicago on the subject of "The Control of Medical Testimony, the Minnesota Plan."

E. M. HAMMES, M.D., *Chairman*

COMMITTEE ON INDUSTRIAL HEALTH

The Committee on Industrial Health has met only once during the last year but various lines of endeavor were discussed which have guided the program during the past year.

Education of the general practitioner is one of the important phases of the program. This phase has been carried forward by numerous articles by members of the Committee published at intervals in MINNESOTA MEDICINE, in addition to the fine Industrial Health issue of the *Journal* published in December, 1942.

Indications that such education is needed lie in the failure of many physicians to return the occupational disease blanks sent to all last year by the Division of Industrial Health. Many are still unaware, apparently, that reports of occupational diseases are required by law and that these reports should be returned to the Division within twenty-four hours. It should be emphasized that these reports are used only for statistical and investigational purposes and may not be brought into court proceedings.

Introduction of more intensive study of industrial health into the curriculum of medical students has been recommended to the University medical authorities but will apparently have to wait until facilities are available.

A. E. WILCOX, M.D., *Chairman*

COMMITTEE ON INTERPROFESSIONAL RELATIONS

The report of the Committee on Interprofessional Relations this year has to do entirely with nursing problems. Nine hundred nurses have entered government service in 1942 and the 1943 quota is an additional 1,120. In the discussions of the nursing problems held during the past six months, the participants have been members of the State Board of Examiners of Nurses, the Minnesota Nurses Association, the Hospital Association, and our Committee on Public Policy and our Committee on Interprofessional Relations.

An unsuccessful effort was made to give credit to the nurses who have satisfactorily completed training in the smaller hospitals at present not recognized by the State Board of Examiners of Nurses toward becoming registered nurses. Back of this lack of success are the standards for Red Cross nurses, who supply the Armed Forces, questions of reciprocity and the regulations enforced by the State Board of Examiners of Nurses.

It is generally agreed that there is a need in civilian practice for two kinds of nurses:

1. The well-trained registered nurse to care for the acutely ill patient and to carry out scientific treatment in the hospitals.
2. The nurse with briefer hospital training who can neverthe-

less take care of the great bulk of less acutely ill patients in the hospital and the home, care for the children, et cetera.

The final outcome after many meetings was the formation of the Advisory Council on Rural Nursing Service, called the Acorns, which is composed of two members from each of the following groups: The Minnesota State Medical Association, the Nurses Association, the Hospital Association, and the State Board of Examiners of Nurses. This Committee is divided into two subcommittees; one to work out a long range program for training in rural hospitals, nurses eligible for registration, and the other to work out details for the training of paid auxiliary workers in the rural hospitals. The subcommittees are now at work on the problem and the latter is working out a plan for a nine months' training course in rural hospitals which do not now have nurses' training courses, the course of study to be supervised by the Board of Examiners. It is further suggested by the Board that those workers who do not take further training shall, for the present, be given a certificate from their own hospital boards certifying that they are hospital-trained auxiliary workers. The objectives of this subcommittee are:

1. To set up standards for guidance of rural hospitals without nursing schools who wish to establish short courses for the training of paid auxiliary workers.
2. To encourage the training of paid auxiliary workers for rural areas.
3. To encourage utilization of such rural hospital facilities as are suitable for education of registered nurses.
4. To encourage such distribution of nurses as will provide more satisfactory personnel for rural hospitals and communities.

The subcommittee has drawn up a tentative program of training for paid auxiliary workers and has sent a questionnaire to all rural hospitals of twenty-five or more beds, which do not now have nurses training courses in order to secure their reaction to the plan. Final determination of the action of this subcommittee rests with the hospitals themselves. The subcommittee to study the long range program has decided to await the result of the questionnaire before proceeding further.

A second Committee has studied the problem of the state hospitals which now have no nursing schools and are suffering from an acute shortage of nurses and the following recommendations were made:

1. That the approval of the State Board of Examiners of Nurses be asked for the establishment of accredited schools of nursing at the following four state hospitals—Fergus Falls, Moose Lake, Rochester and St. Peter, with affiliations for such schools in Minnesota, if possible. It was understood that the Board would stipulate the requirements for such schools and affiliations.
2. That, if the above recommendation is not possible from the standpoint of affiliations, two year courses, the programs of which would be built up around the needs of State Hospitals, be set up in the hospitals named under supervision of the Board, said Board to determine the maximum amount of credit which can be given to graduates of such two-year courses who may wish to enter accredited schools of nursing to be eligible for registration.

F. J. Savage, M.D., *Chairman*

COMMITTEE ON MILITARY AFFAIRS

As Chairman of the Military Affairs Committee, I hereby report that there has been no activity on the part of the Committee during the past year; due to the fact that the reserve contingent within the Medical Association acceptable for active duty, has been placed on active service, and physicians have been inducted from civil practice through the Procurement and Assignment Service Committee.

F. L. Smith, M.D., *Chairman*

Doctor McKinlay: The splendid coöperation given by the Department of Postgraduate Medical Education of the University of Minnesota and the State Board of Health is recognized by the Committee on Child Health and merits the approval of the Association. It is suggested that the Committee on Child Health continue to coöperate with the Parent-Teacher Association committees so that more communities may be interested in the Summer Round-up program. A decline of about 25 per cent has been noted in the number of participating schools. In the Range country the pre-school program has been continued as before, however. Every child is examined prior to entering school and also followed up in successive years, the results being reported to the family physician. At the present time, with many mothers working in war production, measures should be taken so that the home situation is investigated and small children receive proper care while the mother is working. In St. Paul this investigation is conducted by the Family Welfare Board with considerable success and the several war industries are closely cooperating with this Board as reported by Dr. E. M. Hammes of St. Paul. We congratulate the Committee on Child Health for its excellent work.

The Committee on Maternal Health is to be commended for its study, aimed toward finding facts in 112 maternal deaths investigated last year. The results of this investigation will be awaited with great interest.

The Committee on Ophthalmology should also be commended for its part in the attempt to detect early visual disturbances. The value of courses in refraction for general practitioners should be emphasized and their promotion encouraged.

Reports of the Committee on Diabetes, Military Affairs and Fractures are recommended for acceptance, with emphasis on the importance of first aid by a physician, if possible, at the site of the accident.

The splendid work of the Historical Committee is commended and it is hoped that measures will be taken to publish this interesting document as soon as the war emergency is over. The Committee on Medical Testimony is also commended for its courageous work and the apparent good results noted in this state. National recognition of the importance of the Minnesota plan; and also Dr. Hammes' address before the Fifth Annual Congress on Industrial Health and Legal Medicine in Chicago are noted.

In view of the confusion existing over occupational disease, the Committee asks the Committee on Industrial Health to find out what are the reportable occupational diseases mentioned in its report and publish them in the *News Letter* and Minnesota Medicine.

The Committee on Interprofessional Relations is commended for its thorough report and its sincere attempt to meet current nursing needs in rural and city practice, at the same time maintaining educational standards. Complete consideration of this need should be made by members from all parts of the state. The value of using rural hospital facilities should be recognized and the alternative plan for two-year courses at state hospitals is to be commended. Emphasis should be given to the study of rural hospitals of 50 beds or more for the same two-year plan, including an arrangement for credit to be allowed for such two-year courses.

* * *

The Speaker called for five-minute discussions by chairmen of the above Committees and Dr. Monte Piper, Chairman of the Historical Committee, Dr. F. J. Savage, Chairman of the Interprofessional Relations Committee and Dr. E. M. Hammes, Chairman of the Committee on Medical Testimony, responded as follows.

Doctor Piper: War or no war, these records of pioneer physicians in the state are going to be lost and they need to be collected as rapidly as possible.

Doctor Savage: Three problems have come up for consideration during the past year in connection with the nurse shortage. One was the establishment under the State Board of Nurses Examiners, of a nine months' course for nurses aides to be given in the smaller hospitals. In that connection I'm very much interested in Dr. Kurten's account of Wisconsin's plan for legal recognition of such aides after a year and a half course. We found insuperable obstacles in the way of giving girls who are taking a short course credit toward ultimate certificates as registered nurses. In the first place, the Red Cross outlines standards of training necessary for acceptance in the Armed Forces, one of which must be recognition by their own state boards, together with prescribed courses of study in hospitals of a definite number of beds (fifty, I believe), and with adequate staff for instruction. We were up against a stone wall in attempting to give credit for short courses. Our proposal is to leave it to the smaller hospitals who want to establish such courses to give individual certificates of recognition, signed by the hospital. The second problem involves a long range nursing program for smaller hospitals to see if ultimate standards can be established which will permit recognition of their training courses. The third is the problem of the state hospitals where it is hoped a two-year course may

be established which can be allowed credit toward a certificate. The situation in the state hospitals is acute and girls who apply for nurses' training in these institutions refuse to remain when they learn that no recognition will be given them for their two years' work.

I would like to ask Dr. Kurten what agency specifies the course of study for the girls who are to take the one year course in Wisconsin and whether they are to have credit from the State Board of Nurses Examiners later toward their degree.

Doctor Kurten: These girls in Wisconsin will be trained in hospitals having forty beds or more and will be licensed as "Licensed Attendants" because the nurses object to calling them "Nurse Attendants." They will be given work in elementary anatomy, physiology, hygiene, diet and nursing care and will be required to pass an examination set up by the board of nursing education. To qualify they must be eighteen years old and high school graduates, or they must have an equivalent in experience of a high school education since we feel that the course should be open to some older women such as widows of soldiers who must make a livelihood. Graduates will be permitted to practice within certain specified restrictions, answerable always to the Board of Nursing Education, just as registered nurses are, and there will be reciprocity with other states which have established licensed nurse attendants if the course, in the opinion of our Board, compares favorably with our own.

The girls will not be given credit toward a degree because the course will be fundamentally different. However, we expect to take girls who have been unable to continue in regular nurses training if they can satisfy the Board as to their character and fitness. These girls will be given credit for work already done toward their license as licensed attendants.

Doctor Hammes: The Committee on medical testimony is still at a loss to know why a medical man in a State Hospital, for instance, should not be willing to put his complaints concerning medical testimony into writing. The Committee announced officially last year that any such complaint would be held confidential. In fact, the Committee does not even specify in its report whether the complaint comes from a physician, layman or judge, in any case. And yet, although we were in receipt of at least a dozen verbal complaints in connection with our last investigation, we had to wait until some man from outside the state submitted a complaint in writing before we could undertake an essential investigation. I don't think there is any excuse for that. If this committee is to function properly and keep medical testimony in this state up to a high level, we need the coöperation of every member of the Association.

* * *

It was moved, seconded and carried that the Report be accepted.

The Speaker then called for the Report of the Reference Committee on Offcers' and Councilors' Reports, of which Dr. S. A. Slater of Worthington was Chairman. The following reports were considered:

REPORT OF THE SECRETARY

The role of organized medicine in wartime presents extraordinary difficulties because the services of physicians are essential at home as well as on the fighting front.

The number of physicians is strictly limited, furthermore, and incapable of assembly-line expansion. The problem of apportioning them became critical before Pearl Harbor and it had already been placed in the hands of the newly created government agency, the Procurement and Assignment Service for Physicians, Dentists and Veterinarians, several months before war was declared.

It was inevitable that Procurement and Assignment should draw fire from all quarters. Criticism came from the Armed Forces who felt that medical officer procurement was too slow; from civilians who felt that it was too precipitate and that officer material was being wasted in camp which was sorely needed at home; from the so-called boom towns who felt the genuine pinch of scarcity; and from those who found in the situation a fine, ready-made pretext for doing battle anew against organized medicine.

Out of all the heat of charges and counter-charges, a sober realization of the extent of the problem is now emerging in the minds of most of the critics. It is currently evident that no better plan has been evolved to meet the situation than the one which is now functioning with smoothness under direction of the Procurement and Assignment Service.

In Minnesota the plan has operated to provide a substantial "over-age" of younger physicians for the Armed Forces, obviously the first duty of the agency and its State Committee. It has also operated to stop the drain from rural areas due to the early withdrawal of reserve officers, and to hold there a number sufficient to provide all essential services to the civilian population. All this has been done with a fairness and personal disinterestedness which reflects great credit upon the State Committee and its local advisory groups.

The actual physician-to-population status is known in Minnesota as a result of a survey made at the direction of PAS by the State Committee. This survey and the administrative and clerical work of the Committee has been done, from the first, in the State Office, as part of the Association's war contribution.

It became clear, on the basis of the survey findings, that only a few more physicians could safely be removed from the rural districts of the state.

Since January 1, therefore, recruiting has been almost exclusively from the metropolitan centers and from Rochester.

The quota set by Procurement and Assignment for Minnesota was 276 for 1943. This figure took into consideration the fact that Minnesota had contributed 105 per cent of its quota to the Armed Forces in 1942.

To date, 1,225 physicians have entered the services from Minnesota and the 1943 quota, apportioned on a monthly basis, has been met as of May 1.

After the early organizational difficulties of the service which necessitated the temporary expedient of medical officer recruiting teams last year, a regular, satisfactory procedure is now in effect which will take care of army needs.

At the request of Washington, a questionnaire went to all physicians of the state January 1, designed to bring information about each one up to date. That information has been placed on a card file in the State Office and will be kept as nearly up to date as possible. The information will be used to assist the Committee in classification.

The work entailed in this service has been considerable from the start and occasionally overwhelming. It has been done without sacrifice of other services of the Association and with little or no additional office help.

Within the limits of wartime stringencies, the Association has maintained and even expanded its program of public health and postgraduate medical education.

The subject-of-the-month program directed by the Committee in charge of the Coördinated Medical and Public Health Program has steadily increased in popularity to the point where an average of one thousand packets is distributed each month. Included in the number are 200 which are now sent each month to the Minnesota Hospital Association for distribution to its member hospitals. Cost for these are borne by the hospital association. The scientific material is prepared especially for the packet by authorities in their fields. It is mimeographed and distributed from the State Office.

The Association's weekly radio proram passed its 15th anniversary on April 4 this year. W. A. O'Brien, M.D., has continued from the first as speaker. The program is the oldest sustaining program in the Northwest and one of the oldest in the entire country. It has been carried consistently on Station WCCO and is now carried also on WLB, the University station. Its popularity and value has continued undiminished throughout its history. Subjects are selected to coincide with the subject-of-the-month program during packet months, from October through May, thus functioning as an integral part of the Association's medical and public health program.

The regular Association News Service, converted to a question and answer service last year, is used regularly by some 300 weekly newspapers in the State and the volume of questions addressed to the Committee on Public Health Education which sponsors it is constantly increasing. These questions are answered in consultation with appropriate authorities at the University and elsewhere.

The College Lecture Course, long a popular and important feature of the program, was temporarily cancelled for this year due to transportation difficulties, absence of several regular speakers in military service and lack of time on the part of others who normally devote considerable time to this service.

Leaflets and posters urging vaccination and immunization continue to be distributed on request to all physicians and public health authorities who are promoting community programs. Requests indicate considerable activity throughout the state in preventive medicine and protection against wartime epidemics.

The nutrition program of the Association, begun last year with the publication of four popular nutrition folders for distribution by physicians, is going forward. A supply of these folders is still available at the State Office and all physicians are urged to keep them on hand for use of their patients, especially in view of the need for wise selection of foods as a result of rationing.

Wartime scarcities and resultant rationing have affected medical practice at many points and the State Office has endeavored to keep members routinely informed on all regulations as they are issued. Bulletins have been sent out with the regular News Letters of the Association on gas, tires and car ra-

tioning as they affect physicians, on fuel rationing, drug rationing, and scarcities and on special arrangements for modification of food rationing for patients with special dietary demands.

Special "M.D." automobile plates were also prepared and sent to all members whose practice involves emergency calls outside the Twin Cities. By arrangement with the Chief of the State Highway Police, physicians are permitted to exceed the general 35-mile-an-hour limit in case of professional emergency on all highways under his jurisdiction. The plates were prepared with his approval.

In quick response to varied wartime health and medical problems, many committees of the Association have been unusually active this year.

Among notable events of the year was the revival of the old Northwest Regional Conference as the North Central Medical Conference which met again in St. Paul in November, 1942. The revived local Conference will continue to meet annually, or oftener if needed.

It is of interest to Minnesota physicians to note that Dr. W. L. Burnap of Fergus Falls, Chairman of the Council, became Secretary last year of the National Conference on Medical Service and, with other associates among officers of the Minnesota State Medical Association, was responsible for the successful program of the National Conference held in Chicago on February 14. The program was divided between two symposia, one on current wartime problems of medicine, particularly the dangers involved in uninformed and irresponsible federal legislation and directives; the other on postwar problems and prospects. It was the first significant body of physicians from all parts of the country to give serious attention to medicine in the postwar era and drew a large and interested audience. As a result of the day's discussion, the Conference drew up and presented to the Board of Trustees a resolution asking that body to further a policy for stronger representation in Washington. Dr. Burnap was elected President of that Conference for 1944.

The public policy of medicine within the State of Minnesota has for many years been conveyed to state bodies and the public through representatives who worked closely with official agencies. The worth of this procedure has been demonstrated repeatedly in the excellence of Minnesota's accomplishments in public health, its comparatively smooth running machinery for administration of medical relief, its excellent basic science and medical practice legislation. Chairman L. L. Sogge of the Committee on Public Policy spent nearly all of his time during the biennial session of the Legislature, just ended, in St. Paul. With Mr. F. Manley Brist, Attorney for the Association, he has been constantly available to members of the Legislature and state officials for information on all bills involving medicine or the public health. Secretarial assistance and office headquarters for his work were supplied by the State Office.

By action of the Council and the Delegates at the last annual session, dues of all members in service were remitted and a five-dollar assessment was levied for the duration of the war upon members who remain in practice at home.

It should be said for the loyalty and good feeling of all that the extra assessment in addition to dues has been paid promptly and without complaint by the members at home. There is a clear realization on the part of everybody, apparently, that a strong organization is important, in these days of uncertainty and unforeseen demands.

They realize that in Minnesota, as in the rest of the country, there was never a time when the fundamental principles of good medicine must be more frequently and clearly enunciated or more tenaciously supported than now. War will make inevitable many changes in the lives of all, physicians and their patients included. A watchful, patriotic and resolute organization will see, on the one hand, that the best possible use is made of medical services at home and, on the other hand, that such fundamental essentials as free choice of physicians and high standards of care are not sacrificed to wartime expediency.

B. B. Souster, M.D., *Secretary*
R. R. Rosell, *Executive Secretary*

REPORT OF THE TREASURER

The following statement of cash receipts and disbursements for the year which ended December 31, 1942, was made by Shannon and Byers, Certified Public Accountants, who finished auditing the books of the Association on February 26, 1943, and officially reported them correct in all respects.

A comparative summary of the finances of the Association in 1941 and 1942 is shown on page 2 of this statement. It will be noted from this comparison that the income from dues was somewhat reduced during 1942 owing to the departure of members into the military services. Other income of the Association, derived chiefly from the Annual Meetings, also showed a slight reduction from the year 1941.

Further and greater loss of income from dues, resulting from departure of many more members into the military services in 1943, and the decision of the House of Delegates to remit dues for all such members, will be shown in 1943. It will be largely offset, however, by the five-dollar assessment levied by the House of Delegates at the 1942 session. It may be anticipated, therefore, that the finances of the Association will continue on a sound basis.

The Permanent Investment Fund of the Association remains under the able management of the First National Bank and Trust Company of Minneapolis with supervision by the Council. Virtually all the investments made in connection with this Fund have proved to be sound and profitable with the exception of the Nicollet Avenue Properties. It is now understood that Nicollet Avenue Properties have been reorganized and there is a good chance that this stock also may increase in value. The total market value of the fund is placed at approximately $47,233.00 as of this date.

W. H. Condit, M.D., *Treasurer*

MINNESOTA STATE MEDICAL ASSOCIATION STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS FOR THE YEAR ENDED DECEMBER 31, 1942

Current Funds		
Cash on Hand, December 31, 1941:		
American National Bank		
Checking account	$ 368.30	
Savings account	2,632.92	
Exhibit checking account	692.06	
Exhibit savings account	120.50	
Farmers & Mechanics Bank		
Savings account	5,388.36	
First National Bank		
Savings account	63.87	
		$ 9,266.01
Cash Receipts, Year 1942:		
Dues collected:		
For years 1939 and 1941	$ 60.00	
For year 1942	35,317.50	
For year 1943	5,280.00	
	$40,657.50	
Technical Exhibit rentals collected:		
For year 1942	$ 3,747.50	
For year 1943	2,321.25	
	6,068.75	
Annual Meeting banquet and luncheons	834.75	
Bruce Publishing Co. (Minn. Medicine)	1,318.67	
Interest	164.28	
Profit, Diabetes Committee	101.02	
Contribution, Tuberculosis Committee	1,000.00	
Refund, 1940 unemployment tax	160.11	
		50,305.08
		$59,571.09
Cash Disbursements, Year 1942:		
Special committees:		
Historical	$ 50.72	
Hospital and Medical Education	42.32	
Medical Advisory	53.09	
Medical Economics	349.19	
Public Health Education and Radio	4,800.67	
Public Policy	7,302.46	
State Health Relations	78.75	
Tuberculosis Committee	170.40	
Military Affairs	91.40	
Unbudgeted Committees	499.66	
Ophthalmology	500.00	
Procurement and Assignment	700.00	
Special appropriations:		
"100 Years of Medicine"	791.75	
"Fifty Club"	249.05	
Conferences and Meetings:		
Technical Exhibit and Annual Meeting	5,206.98	
Delegates and conferences	593.30	
Council meetings	360.42	
County officers' meetings	398.12	
Minnesota Medicine	5,065.36	
Office equipment	869.64	
Refund of dues	30.00	
Administrative:		
Executive Secretary's salary	6,000.00	
Executive Secretary's expenses	1,348.20	
Office salaries	6,534.00	
Office salaries, extra help	54.00	
Office rent	1,440.00	
Office supplies	288.88	
Postage	399.81	
Telephone and telegraph	350.00	
Miscellaneous expense	368.19	
Membership expense	537.69	
Audit and insurance	271.51	
Social security and unemployment tax	146.97	
Periodicals	118.50	
President's contingent fund	56.18	
Secretary's salary	200.00	
Secretary's expenses	186.86	
Treasurer's salary	100.00	
Salaries advanced	190.00	
		46,794.07
Cash on Hand, December 31, 1942:		
American National Bank		
Checking account	401.65	
Savings account	2,672.63	
Exhibit checking account	2,805.44	
Exhibit savings account	1,335.86	
Farmers & Mechanics Bank		
Savings account	5,496.94	
First National Bank		
Savings account	64.50	
TOTAL CASH ON HAND		$12,777.02

COMPARATIVE SUMMARY

Income:	*Year 1942*	*Year 1941*
Income from dues	$33,500.83	$33,734.14
Other income	3,404.55	3,583.62
	$36,905.38	$37,317.76
Expenses:		
Special committees	$13,666.74	$16,871.88
Special appropriations	1,417.82	
Conferences and meetings	1,351.84	1,060.99
Administrative	18,651.19	16,621.54
	$35,087.59	$34,554.41

REPORT OF THE CHAIRMAN OF THE COUNCIL

Three regular sessions of the Council have been held since the last Annual Meeting. In addition, all members were present a fourth time in St. Paul for a special meeting called in connection with the legislative session.

The Council has dealt in detail in these meetings with a variety of matters having to do with Civilian Defense, with the public health, new federally-supported health programs, state legislation dealing with medical matters, shortages of physicians and nurses resulting from the war, appointments to the State Board of Health and the Board of Medical Examiners, routine business having to do with membership and investments and far-reaching plans for coöperative action on the part of state medical associations of this section, looking to the shaping of more active and realistic national policies for medicine.

Plans were made at the October meeting for a conference of medical association representatives in this section to meet in St. Paul in November and revive the old Northwest Regional Conference. This Conference lost its character as a regional conference when it was converted to the National Conference on Medical Service. The meeting was held with representatives of Wisconsin, Iowa, North and South Dakota, and Nebraska present and a resolution was drawn up for presentation at the National Conference in February which in turn resulted in a general demand on the part of many states for action. The final resolution as drawn up by a Committee of the National Conference will be presented for action before this House and, if approved here, before the House of Delegates of the American Medical Association in June.

Dr. Malvin J. Nydahl, Director of the Division of Crippled Children of the Division of Social Welfare, presented the program of his Division for children with heart ailments, a demonstration program covering only a small area, with medical and hospital care at the Children's Hospital in St. Paul. Dr. J. A. Myers presented a new program for certification by the Minnesota State Medical Association of county and state institutions for care of the tuberculous. The program was accepted by the Council and standards and certificates were approved.

A group of nurses representing the nurses' organization and the State Board of Examiners of Nurses brought before the Council the suggestion that legislation be considered for registration of practical nurses to help out the critical nursing shortage and provide a measure of protection and control. Discussion at this and subsequent meetings resulted in referring the entire nursing situation, particularly in rural hospitals, to the Committee on Interprofessional Relations and the Committee on Public Policy for study and consultation. Results of subsequent conferences are presented in the report of the Committee on Interprofessional Relations.

Dr. A. J. Chesley kept the Council carefully and closely informed on all activities of the State Board of Health and the Council is indebted to him as always for his fine coöperation with the medical profession in the entire program of his department in Minnesota.

At the December meeting, final details were ironed out for the federally-supported program for medical service to wives and infants of men in the military forces. This program was subsequently abandoned when original funds were exhausted and new regulations will be presented to the Council at its next meeting it is understood, for reëstablishing the program with new funds appropriated by Congress.

The need for additional funds for the State Board of Health, especially for the Division of Vital Statistics and for Sanitation, was presented and referred to the Committee on Public Policy with instruction to aid in any way possible in securing the needed appropriations from the Legislature.

The current program of the Minnesota Society for the Control of Cancer was presented to the Council by Dr. M. W. Alberts, Chairman of the Committee on Cancer, which works closely with the Society, and approved. At the same time, a $100.00 life membership was voted for the Association in the Minnesota Society for the Control of Cancer.

It was decided also to refund dues of members who go into service, on a pro-rata basis, and to consider members who go into the United States Public Health Service on the same basis for this purpose as men who go into the Armed Forces.

The question of payment by the State and by the so-called unorganized counties for patients in tuberculosis sanitoriums was discussed with representatives of the sanitoriums and of the Committee on Tuberculosis. It was decided to suggest a thorough study of the matter by the State Board of Health and the Division of Social Welfare before recommending any further legislation on the matter. Meantime, an upward adjustment in payments required for patients from unorganized counties in the state institution, was approved. This adjustment can be made, it is understood, without legislation. The problem of incorrigible patients, also brought to the attention of the Council by the Committee, will be incorporated in the study recommended by the official agencies designated.

The Council was informally assured that the medical policies for recipients of relief and Social Security Aids established by Mr. Walter Finke for the Division of Social Welfare would be continued by Mr. Bernard LeVander, his successor, and expressed its gratification.

The problem of payment for medical services in terminal illness of recipients of Social Security Aids which has heretofore proved a source of difficulty was discussed and referred for action at this session of the Legislature by the Committee on Public Policy. But a subsequent decision by the Attorney General to the effect that such payments may be made without recourse to legislation can now be relied upon to adjust this matter. No legislation is regarded as necessary.

The Minnesota Hospital Service Association is among many bodies whose functions involve care of the sick and who present their programs as a matter of routine for Council information and approval. A slight change in hospital service contracts was approved, subject to agreement in phraseology between the Association and our Attorney.

It is interesting to note the experience of the Council Committee composed of George Earl, A. W. Adson, and W. A. Coventry, appointed to work with representatives of allied organizations at the request of the Minnesota Conference of Social Work, on a study of medical services in Minnesota. The joint committee met three times, became convinced of the magnitude of the task and of the futility of attempting it without funds and disbanded.

Council members last year became health chairmen for their districts in the Civilian Defense organization of the State and as such have familiarized themselves thoroughly with the emergency resources of their respective sections of the State. For that reason members of the Council have been officially constituted as the "War Participation Committee" of the Minnesota State Medical Association. They stand ready to carry forward whatever tasks the war emergency may lay upon the medical profession in Minnesota.

At the special meeting called in the final days of the Legislative session, every member was present and the stand of the Committee on Public Policy against confirmation of the appointment of Mr. N. H. Debel on the Industrial Commission was unanimously endorsed. At this meeting the Council also extended a vote of unqualified commendation, confidence and approval to Dr. L. L. Sogge, Mr. F. Manley Brist, and Mr. R. R. Rosell for their untiring efforts and conduct in opposing the confirmation of Mr. Debel.

All members of this body are active in practice and find their responsibilities greatly increased at home as a result of the war. All have been meticulous, nevertheless, in performance of their duties as councilors and deserve the highest commendation for their conscientiousness and devotion to our affairs.

W. L. Burnap, M.D., *Chairman of the Council*

REPORT OF THE COUNCILOR OF THE FIRST DISTRICT

The population of the First District is approximately 303,000 and the area is 6,861 square miles. Within the eleven counties composing this district there are thirty-four hospitals and approximately 170 physicians (exclusive of those who serve at the Mayo Clinic). The ratio of physicians to population in the district is about 1 to 1,700. In November, 1942, the ratio for the state as a whole was 1 to 1,502 and at that time the ratio for the rural population of the state, calculated after excluding Minneapolis, St. Paul, Duluth and Rochester, was 1 to 1,949. We have ninety-eight communities and about half of these have populations of less than 500. The problems of medical care in the communities of this district are similar to those in other parts of the state. Thus far we have had no serious problems but if further demand is made for the release of physicians from the rural communities, our position will be difficult.

In the First District there are seven cities which are classified in the 10,000 population class and emergency medical services have been established in each. These cities and their respective emergency medical chiefs are listed below, and also are recorded the occasions on which blackouts were carried out.

City	*Emergency Medical Chief*	*Blackouts*
Albert Lea	S. A. Whitson, M.D.	Oct. and Dec., 1942
Austin	B. J. Cronwell, M.D.	Dec. 7, Dec. 14, 1942, and Feb. 3, 1943
Faribault	P. H. Weaver, M.D.	Dec. 14, 1942
Owatonna	J. A. McIntyre, M.D.	Oct. Dec. 14, 1942, and March 1, 1943
Red Wing	H. T. McQuigan, M.D.	Sept. 17 and Dec. 14, 1942
Rochester	F. M. Feldman, M.D.	Oct. 29, Dec. 14, 1942 and Feb. 18, 1943
Winona	S. Schaefer, M.D.	Sept. 10 and Dec. 14, 1942

Dr. L. Breslow, Director of the Minnesota Department of Health, District No. 3, has served us well and should be commended for his coöperative activities in connection with the problems of civilian defense in our district.

The services of all communities follow a uniform pattern.

The emergency medical chief is a member of the Central Control Group and maintains headquarters at the control center during blackouts. Organization of hospitals, ambulances, physicians, nurses and auxiliary workers are carried out under his direction.

During an emergency hospitals maintain a supply of surgical equipment and teams of physicians report to these hospitals. In some instances these teams and also some of those who are proficient in first aid have been selected to attend first aid stations or the scene of an incident. In case of damage to hospitals or when their facilities are exhausted, arrangements have been made for setting up of auxiliary hospitals in buildings such as schools and other public institutions, where beds, blankets, cooking equipment, running water and so forth are available.

Whenever ambulance service is inadequate, delivery trucks and similar vehicles are prepared to serve under the emergency medical chief for the transportation of casualties.

In Rochester the Emergency Medical Service, organized under the Rochester Defense Council, is headed by Dr. F. M. Feldman as Emergency Medical Chief, and he is assisted by nine physicians and twenty-two nurses. These physicians and nurses are grouped into units to expedite dispatching and they have nine ambulances at their disposal. First aid equipment is packed and ready for use at all times.

Recently the Olmsted County Red Cross Disaster Preparedness Committee was reorganized and the Emergency Medical Service Committee was incorporated bodily therein as the medical committee of the Red Cross group. This arrangement prevents duplication of emergency medical organizations.

In all trials practiced thus far all phases of the emergency medical service have functioned with an admirable degree of efficiency.

L. A. Buie, M.D., *Councilor*

REPORT OF THE COUNCILOR OF THE SECOND DISTRICT

The usual scientific and economic meetings have been held in the several societies during the past year, which meetings, under the circumstances, have been very well attended. Programs of immunization and vaccination have been carried on by several of the county medical clubs, and the report is that they have been more successful than in previous years. Mantoux testing, also, has been carried out in some counties. The Procurement and Assignment Committees have done a fine piece of work and have accomplished their difficult task to the greatest satisfaction of all concerned.

Our proportion of young physicians entered the Service, leaving us older men at home; but everyone has done all in his power to help out the situation so we do not believe any community is suffering from lack of medical attention.

The Welfare Board in most of the counties of the second district has accepted the Fee Schedule as recommended by the Department of Social Security, Division of Social Welfare.

L. L. Sogge, M.D., *Councilor*

REPORT OF THE COUNCILOR OF THE THIRD DISTRICT

It is with a great deal of pleasure that I can report to you that the condition of the Medical Societies in the Third District is satisfactory.

In spite of the number of young men who have entered the service, the civilian population has been cared for in a manner which has left no room for complaint. It is, however, my impression that, unless an extreme emergency arises, not very many more men can be spared from this section of the State.

Immunization programs have been carried on as usual, and it is hoped that these may continue, with added support from the public.

Travel difficulties, together with an increased amount of work required of each man, have made attendance at medical meetings more difficult. However, every attempt has been made to carry on as usual, and to maintain a high degree of interest in medical matters. These efforts have met with a gratifying amount of success.

Unemployment and indigency are less evident. This is in all probability due to the war effort. It would, therefore, seem the part of prudence not to consider this problem as solved, but rather as temporarily relieved.

The nursing situation in rural communities has been aggravated by conditions brought on by the war. Each hospital has, however, been able to maintain a satisfactory service to its patients, and for this, they rightfully deserve a great deal of credit. In view of the fact that one-third of the patients who are hospitalized are cared for in rural communities, it becomes apparent that the rural situation should be an important factor in the formulation of any nursing program which seeks to remedy the present scarcity of nurses. While it is realized that in emergencies each one of us must make the best of the situation as it exists, it is to be hoped that, when the solution of this problem is attempted, it will be approached in a realistic manner.

It has been a great deal of encouragement to me to observe the interest manifested by the members of our Society in all angles of organized medicine. It is my opinion that a great deal of credit should go to our hard working Committee on Public Policy, headed by Dr. Sogge, our very able attorney, Mr. Brist, and our very efficient executive secretary, Mr. Rosell.

C. M. Johnson, M.D., *Councilor*

REPORT OF THE COUNCILOR OF THE FOURTH DISTRICT

The affairs of the societies in the Fourth District are in a healthy condition. In the past year, special interest has been focused on matters pertaining to the war effort, and the proper distribution of doctors in the military service and for civilian care at home. Both of these items are in good condition. What the future will bring cannot be told. Further stringency may be required in both fields.

The membership in the various societies holds up, and the change in annual dues to take care of those away in military service has been accepted in a fine patriotic spirit.

Attention has been given in the various communities to the establishment of emergency units among the doctors, nurses, and hospitals to take care of possible air raids and other emergencies. It seems practical to continue the setup after peace comes, to take care of non-military emergencies, as was so well demonstrated in the Boston catastrophe in the past year.

Our doctors are doing their duty in the Home Guards and are taking part in the Red Cross, War Bond, U.S.O., and other services.

In one of the Societies, a question of unethical advertising had arisen. Usually these matters are best taken care of by the Board of Censors of the local County Society as recommended by the AMA; things were satisfactorily arranged in this manner in the local instance.

The Minnesota Hospital Service Association continues to do good work and several new hospitals have been added to their list.

We were privileged on invitation to address the Renville County Society on the subject of "Medical Ethics" and suggest that any of the Societies call on their Councilor at any time he can be of help in this or a similar capacity.

The question of local welfare is brought up occasionally, and we were fortunate in having matters explained and rectified through the excellent advice of Doctor Simons.

Last July, the chairman of our State Legislative Committee, Doctor L. L. Sogge of Windom, sent out a letter in regard to the Tolan Bill which was under consideration in Washington. This letter was such a model of thoroughness in explaining to the respective national legislators the reasons why a chiropractor should not be given the same privilege as an authentic doctor of medicine, that I suggest that those who have not seen this letter ask to see it. I wish especially to commend the fine work done in this State by this Committee on Public Policy under the able leadership of Doctor Sogge, Mr. Manley Brist, and Mr. Rosell.

I wish to express my appreciation for the coöperation of the Societies and Officers of this District.

A. E. Sohmer, M.D., *Councilor*

REPORT OF THE COUNCILOR OF THE FIFTH DISTRICT

It is gratifying to report that the civilian defense program in the Fifth Councilor District is progressing very satisfactorily. Several meetings of the Ramsey County unit were attended, and also one meeting of the rural Ramsey County group. There was a general meeting held at the University, which was called by Dr. Chesley, and at this time, the activities and problems of the civilian defense program were thoroughly discussed. It is very encouraging to find the wholehearted support that is given through the entire district in regard to the civilian defense program.

During the past year, two meetings of the Washington County Medical Society were attended, and very interesting programs were presented at these meetings.

Communications from the Council on Medical Education and Hospitals were received regarding the registration and recognition of certain hospitals in this district. These communications were answered and recommendations were offered.

E. M. Jones, M.D., *Councilor*

REPORT OF THE COUNCILOR OF THE SIXTH DISTRICT

Out of the 668 members of the Hennepin County Medical Society, 137 had gone into the military services when this report was written. This number included also junior members and applicants for membership.

According to the most accurate figures available, a total of 300 physicians including all non-members had left Minneapolis to join the Armed Forces.

A resulting increase of responsibilities for those who have remained at home is unavoidable. But there is every evidence, to date, that medical service will be adequate to take care of all civilian needs and that no apprehension of any serious lack of facilities need be anticipated, either in Minneapolis, itself, or in the rural sections of the District.

Control of preventable disease and protection against wartime epidemics has been urged upon all societies by the state medical association as an important part of the wartime program of organized medicine. The Hennepin County Medical Society responded this year with another vigorous and highly successful campaign for vaccination of every citizen in the County. Exact results have not yet been tabulated, but it is definitely known that the vaccination status of the County has been very considerably raised.

As Health Chairman for the District in Civilian Defense Work, the Councilor for the Sixth District is glad to report the existence of excellent organization, both in the city and the rural

districts, to care for medical emergencies and to maintain civilian health under crisis conditions.

Many members have undertaken considerable added burdens to perfect the organization and all are working harmoniously in their own organization and in coöperation with other agencies to maintain medical service of a high standard at home, regardless of what the future may have in store.

A. E. Cardle, M.D., *Councilor*

REPORT OF THE COUNCILOR OF THE SEVENTH DISTRICT

Three results of the war upon physicians and medical practice in this district warrant the attention of such a report as this. Medical meetings, even though less frequently held, are poorly attended. Economic aspects of practice occupy a far less prominent part now in the minds of physicians. Physical and mental strain of additional practice demands occasioned by the shortage of physicians has reflected itself in scattered sections of this District.

In the two medical societies comprising this District, the Secretaries, Dr. G. I. Badeaux and Dr. John Libert, have found it extremely difficult to prepare good meeting programs. Tire and gas rationing as well as the lack of time of physicians have prevented securing extra society speakers and society members appear unable to prepare papers for meetings. For these reasons, and since physicians apparently are too busy to attend meetings, society meetings have been reduced from four or twelve a year to two or three a year.

Economic interests in the minds of the physicians throughout the District have distinctly changed. Indigency is much less apparent and the added demands on the time of the physicians still in civilian practice apparently leave little time for concern over money or income. This fact seems to be apparent throughout the District.

Evidences of the added strain occasioned in various ways by the war upon civilian physicians have been manifested in a higher incidence of coronary disease among doctors and in other tension and exhaustion syndromes. While these factors have not reached a point of seriousness to endanger medical care for civilians, the fact that they are apparent in such widely scattered localities in the District warrants attention.

Edwin J. Simons, M.D., *Councilor*

REPORT OF THE COUNCILOR OF THE EIGHTH DISTRICT

The Eighth District, containing the three societies, Red River Valley, Clay-Becker, and Park Region District and County, includes the northwest corner of the State—a very large area, but it requires very little supervision.

The officers and members as a group are well informed and coöperative with the State and National Associations. The Councilor, therefore, has devoted his energies to the affairs which concern the State and National societies and only indirectly the Eighth District. Considerable has been accomplished, as you can learn from the reports of the Council and other matters which will be presented to you at this session.

W. L. Burnap, M.D., *Councilor*

REPORT OF THE COUNCILOR OF THE NINTH DISTRICT

An appraisal of the activities of the past year must be prefaced by that of the members in active service with our military forces. Thirty-one members are serving from Duluth and twenty-eight from the remaining district. Promotion in rank has come to many who enlisted early in the Reserves. For heroic action, following the sinking of his torpedoed ship, Dr. John Peterson has been cited by the Navy with appropriate award. A number of the members are in theaters of operations where active duty is being experienced. Those returning on leave of absence were grateful for the greetings from our State Association during the holidays. This thoughtful recognition did not pass without notice and comment from their associates from other states. We should enlarge on these contacts.

For those remaining in civilian service, it has been a year of added responsibility and much increased activity. There is no information that any community has been handicapped in medical service through this shortage. There remain ninety-one physicians in Duluth and eighty-nine in the remaining district. There has been no lack of interest in scientific meetings or responsibilities to the war effort. The Range Medical Society has also met regularly. The dues of all members are paid at this date.

Organization has continued in civilian defense. Aid has been given to the hospital in setting up plans for care of large emergencies. The membership is organized so that we are assured of smooth operation and dispatch of personnel in any catastrophe. At present standardization of certain treatments is receiving consideration of a Committee.

The adoption of the medical fee schedule for relief cases, proposed by the State, to the County Welfare Board, has been an accomplishment. This was accepted with but few minor alterations. Our medical director is capably organizing these activities and enhancing a cordial relationship in this field.

The attendance of members from this District to the County Officers' Meeting showed a good representation with much interest in the program.

F. J. Elias, M.D., *Councilor*

Dr. Slater: It was heartening to the Committee to see the work put in and the accomplishments obtained by the Officers and Councilors of this Association. I wish every member of this House could take the time to read the reports and then would report back to his Society. Your officers and councilors have done a mighty good job for which you and the rest of the members of the Minnesota State Medical Association can well be proud. The report of the secretary shows that the work of his office has increased, as was to be expected, during wartime. The assistance given the Procurement and Assignment Service has been the biggest job of the year since all of the paper work for the state was handled by his office. Minnesota has been able to meet its quota for the Armed Forces but, according to the records and studies made by the State Committee on Procurement and Assignment, rural districts can spare few more physicians and future quotas must come from the large cities.

The Association has maintained and, in many instances, increased its activities in public health and postgraduate medical education and it is interesting to note that the weekly Association radio program by Dr. W. A. O'Brien, now one of the oldest and most popular programs in the country, passed its 15th anniversary on the air April 4. Committees of the Association have been active and the State Association seems to be meeting all new conditions and handling them efficiently. These are serious and trying times. They make an extra burden for all; but at the same time everything is being done to see that the Association meets its obligations and protects our interests.

The Treasurer's report shows the Association to be in sound financial condition though the income for 1942 was slightly less than the income for 1941 due to loss of dues of members entering the service. The assessment of $5.00 on those at home will apparently, to a large extent, make up for that loss in the future. The market value of the permanent investment fund now amounts to $47,233, a very gratifying sum. It is gratifying, also, to know that the administration has been able to keep down expenses of the Association in spite of the increased work.

The report of the Chairman of the Council shows that the Councilors, in spite of the fact that they find themselves confronted with extra duties like the rest of us, are giving their best efforts to their duties as Councilors. As a Council they are doing an excellent job for which we should all be thankful. Reports of the individual Councilors show that the war has brought many new problems all over the State. Added responsibility and increased work have been left by the men in military service to those who remain at home but apparently patient needs are being met. Medical and health aspects of Civilian Defense are being organized by the Councilors in most, if not all, of the Districts. It would be wise if these organizations were continued after the war to take care of disaster emergencies. Conditions in the Societies of the various Districts seem to be highly satisfactory though attendance at meetings has slightly decreased. The Councilors throughout the State have done an excellent job and deserve the appreciation of the members of the Association.

* * *

There being no Officers or Councilors who wished to discuss their reports, it was moved, seconded and carried that the reports be accepted.

The Speaker then called for the report of the Reference Committee on State Health Relations, Dr. C. B. Drake of Saint Paul, chairman. The following reports were considered:

COMMITTEE ON UNIVERSITY RELATIONS

The Chairman of this committee has had informal conferences with Dr. W. A. O'Brien and Dean Diehl, but no specific problems have come up for extensive discussion or solution.

H. Z. Giffin, M.D., *Chairman*

COMMITTEE ON STATE HEALTH RELATIONS

Your committee made a further study of the office of coroner in Minnesota and elsewhere, intending that recommendations might be made to the Legislature. Because of circumstances beyond our control, the study was not entirely completed in time for any definite recommendations at the present legislative session. However, we understand that a bill was introduced from other sources embodying some of our ideas. This whole matter deserves further study and may accomplish more in less critical times.

Aside from this one study, the Committee has kept up its liaison with the State Health Department and to a less extent and less formally with the Division of Social Welfare.

T. H. Sweetser, M.D., *Chairman*

COMMITTEE ON PUBLIC POLICY

Your Committee on Public Policy wishes to respectfully submit the following report in reference to the 1943 Session of the Minnesota Legislature. 1,320 proposed laws were introduced in the Senate and 1,462 were introduced in the House of Representatives. We examined at least the title of every bill introduced and the entire bill where it concerned the practice of medicine in any of its phases. A total of 646 of these bills were enacted into law.

One of the outstanding bills passed by the Legislature is the so-called Occupational Disease Bill. This bill amends the present Workmen's Compensation Law of Minnesota to provide for blanket coverage of all occupational diseases; prior to the enactment of this law only certain specified diseases were compensable as occupational diseases. The new law is of paramount importance to employes throughout the State of Minnesota, and indirectly to the medical profession, the hospitals and others whose duty it is to care for these employes. This law will be published in full in a future issue of Minnesota Medicine and your Committee urges every member of the medical profession to take the time to read this new law.

An amendment was passed to the present Coroner's Law, which increases the fee of the coroner from $5.00 to $10.00 per day for viewing a dead body; from $5.00 to $10.00 per day for holding an inquest and from $6.00 to $15.00 per day for doing an autopsy. The amendment also enables a physician and surgeon, who is a coroner, to render medical services to a recipient of relief and to be compensated for his services. Until now the public examiner had ruled that a physician-coroner could not collect for medical services rendered to a recipient of relief on the theory that he was a public official and could not be compensated for more than one job. The new law also provides that a physician-coroner shall be eligible to act as an examiner in proceedings in the Probate Court. In the past many physicians have refused to be a candidate for county coroner because of the fact that they were disqualified from rendering medical care to a recipient of relief. The medical profession of Minnesota is indebted to Senators Sletvold of Detroit Lakes and Rosenmeier of Little Falls, and to Representative Boze of Detroit Lakes, for their sponsorship of these amendments. The new law does not apply to Ramsey, Hennepin nor St. Louis Counties, which counties have full-time coroners and special laws applying thereto.

The question of paying for terminal illness of a recipient of relief was discussed and it was felt that an amendment should not be offered to the old age assistance act, for the reason that such an amendment might be in conflict with the Federal Law, and as you know, part of this money is furnished by the Federal Government. Nevertheless, Senator Stiening of Moorhead obtained a ruling from the Attorney General which holds that the appropriate political subdivision is legally liable for medical care rendered during the last illness to a recipient of relief, if the services were of such a nature that the recipient was unable, under those circumstances, to pay for such services. Obviously, a recipient of relief is not able, in the average case, to pay for extended medical care or hospitalization out of the monthly allowance that is received by way of old age assistance. In order to acquaint the medical profession of Minnesota with this ruling of the Attorney General, the correspondence will be published in full in Minnesota Medicine. This is an important matter from the standpoint of not only the recipient of relief, but the medical profession and the hospitals, and it is hoped that every physician will acquaint himself with the opinion rendered by the Hon. J. A. A. Burnquist, Attorney General. We are very grateful to Senator Stiening for the interest that he took in this matter and for the ruling that he obtained from the Attorney General.

We were again confronted with the so-called Eagles' Bill, the purpose of which was to give fraternal organizations the right to furnish medical care to members of the lodge and their families through the medium of employing physicians to render such medical care. The bill was supported, primarily, by the Fraternal Order of Eagles, but was rejected by the House Committee on Public Health, and in turn, by the House of Representatives. Due to the fact that the bill was killed in the House, it did not come to a vote in the Senate.

Considerable discussion took place as to the desirability of amending the Nurses' Registration Law in Minnesota to provide for another classification of nurses. This subject has received considerable discussion of late because of the present war emergency and the dilemma in which many hospitals, particularly the rural hospitals, find themselves. Several meetings were held with representatives of the Minnesota State Board of Nurses' Examiners and the Minnesota Nurses' Association, the Minnesota State Hospital Association, the Director of Public Institutions of the State of Minnesota and others. After a thorough discussion of this matter it was the unanimous opinion of all concerned that more could be accomplished by the creation of a committee to represent the various groups concerned, and effort directed, during the next two years, to work out a solution for the demand for nurses in state institutions and other hospitals throughout the state. It is the opinion of your Committee that these various organizations, working together, can and will solve this problem, and that if legislation is necessary, helpful suggestions can be made to the next Legislature that will have the approval of the various groups. Your Committee wishes to commend the State Board of Nurses' Examiners, the Minnesota Nurses' Association and the Minnesota Hospital Association for the splendid attitude displayed during these meetings and for the willingness that was manifested by all to meet the problem in a way that will best serve the iterests of the public, the nurses themselves, the hospitals and the medical profession.

The Minnesota State Medical Association also opposed the reappointment and confirmation of Mr. N. H. Debel as a member of the Industrial Commission. Our opposition was based upon the fact that the House of Delegates of the Minnesota State Medical Association, at the 85th Anual Meeting held at Duluth in 1938, adopted a resolution declaring itself

> "In thorough accord and support of the principle that, in the interests of good public policy, the patient shall be permitted to choose his own physician, in cases involving liability and compensation insurance, as well as in private practice."

Notwithstanding the fact that Mr. Debel was fully aware of the opposition voiced by the Minnesota State Medical Association in 1931, to the confirmation of a former member of the Industrial Commission who had expressed opposition to the laws of this state as interpreted by the Supreme Court, giving an injured workman the right to be attended by a physician of his own choice, Mr. Debel wrote the opinion in the case of Carmody vs. the City of St. Paul, in which he held, squarely, that the injured workman did not have such right. Some of you will recall that Mr. Debel was a guest speaker at the 1939 County Officers Conference of this Association, at which time he assured the medical profession that they had little to worry about in having their bills paid if they rendered competent medical care for a reasonable fee. Less than one year later Mr. Debel wrote the opinion in the Carmody case. Under those circumstances it was impossible for us to have the confidence in Mr. Debel that we feel we are entitled to have "in a fair-minded and unbiased commissioner." We are advised that the final vote in the Senate Workmen's Compensation Committee was 11 to 1 against Mr. Debel. Subsequently, Governor Stassen withdrew his name.

Numerous other bills were introduced but neither space nor time permit us to go into a detailed discussion of them. Some of these bills received the support of your Committee and others were opposed. A verbal report will be given to the House of Delegates if it is so desired. Notwithstanding the fact that this has been one of the most strenuous sessions that we have ever attended, we do wish to express our gratitude to the House of Representatives and to the Senate for the courteous hearings that were accorded us and for the very fair treatment that we received.

L. L. Sogge, M.D., *Chairman.*

Doctor Drake: We recommend that the Committee on University Relations be continued and the report accepted in spite of the fact that no specific problems have been handled by the Committee this year. Many matters of importance are likely to come up involving the doctors of the State and the medical school. It is recommended that the report of the Committee on State Health Relations be accepted and the Committee continued, especially as a connecting link between the State Board of Health and the medical association.

This Committee believes that the work of the Committee on Public Policy should be highly commended under the leadership of Dr. Sogge and his able assistant, F. Manley Brist. In the passage of the Occupational Disease bill, a definite forward step has been made in providing just compensation for the worker. The medical profession of the State will need to be on guard, however, to see that the law is not abused. The increase in fees allowed to coroners under the amendment to the law and the removal of restrictions related to acceptance of fees from relief agencies should tend to raise the standards of the coroner's office throughout the State. The ruling of the Attorney General obtained through Senator Stiening of Moorhead which holds that the local political subdivision is legally liable for care rendered in the last illness to any recipient of relief who is unable to pay, obviates the necessity for any legislation in this matter. Such legislation would have been difficult to secure in view of conflicting federal regulations for use of matching funds in the program of Old Age Assistance.

The response obtained by the Committee on Public Policy from the profession at large in regard to the reappointment of Mr. Debel on the Industrial Commission

ought to assure the Committee that the Medical Association as a whole endorses its opinion on this matter.

* * *

No chairmen of the above Committees wished to discuss their reports and it was moved, seconded and carried that they be accepted.

The Speaker then called for the report of the Reference Committee on Lay Education Reports, Dr. Monte Piper, Chairman. The following reports were considered:

COMMITTEE ON PUBLIC HEALTH EDUCATION

Your Chairman of this Committee feels that this year should exemplify action and accomplishment rather than a summary of aspirations.

It is a pleasure to acknowledge the intensive work and accomplishments of many of the scientific committees of the Association, whose chairmen make up the executive body of this Committee.

The work started by the Committee on Tuberculosis under the chairmanship of Dr. J. A. Myers, with special reference to the Meeker County survey with studies aimed to eradicate tuberculosis from all counties, has received highest approbation and has been written up in various medical journals. This Committee has brought Col. Esmond R. Long, in charge of all tuberculosis in the U. S. Army, to its meeting, held in St. Paul, April 20. The entbusiasm developed by Dr. Myers and his coworkers is a fine example and should stimulate other Committees to like accomplishments.

Special recognition also goes to the Committee on Child Health for its effective coöperation with the University and the Division of Child Hygiene in promotion of child health in wartime, both in its public aspects and in the field of medical education. Attention should he called to the program arranged for this meeting on Wednesday, May 19, by Chairman R. L. J. Kennedy. Interested laymen have been invited to tbis meeting.

The Committee on Conservation of Hearing deserves mention for its consistent effort under the chairmansbip of Dr. Horace Newhart to bring facilities for discovery and treatment of hearing defects to all Minnesota scbools. Also to the Committee on Cancer and its chairman, Dr. Max Alberts of St. Paul, for its sponsorsbip and guidance of cancer education activities of the Minnesota Society for the Control of Cancer.

Many others including tbe Committee on Industrial Healtb, the Committee on First Aid and Red Cross, on Vaccination and Immunization, and on Maternal Health, have been active and alert to the unusual demands of the times.

The report of the Radio subcommittee is submitted by tbe Chairman, Dr. R. M. Burns, separately; but it should be noted here with pride that the regular weekly broadcast of the Association by Dr. W. A. O'Brien on station WCCO passed its 15th anniversary on April 4 this year. This is a significant milestone in tbe history of our program of public health education and an extraordinary tribute to Dr. O'Brien himself as speaker and educator. His is one of tbe oldest educational programs of any sort on the air today. It has been increasingly popular as the years have gone on and the fact that he has never failed to appreciate keenly the problems of the practicing physician is as great an evidence of his skill as is his personal popularity.

The Editorial subcommittee tbrough its chairman, Dr. R. M. Hewitt of Rochester, has acted in an advisory capacity on several occasions, reviewing and making suggestions on citations to be presented last year to members of the Fifty Club and to the banquet speaker, Dr. A. J. Carlson, and also on five newspaper articles prepared by tbe Hennepin County Tuberculosis Association, including an introductory article, and four others on "Fatigue," "Food Is Fuel," "The Common Cold," and "Overweight." In these and other such matters, material must be handled too quickly to permit calling for a Committee meeting. Under present difficult conditions it has seemed inadvisable to call such a meeting without definite purpose. Tbe Committee stands ready, nevertheless, to take appropriate action wbenever it is called upon by any Committee or official of the Association.

The excellent packets issued monthly as part of the subject-of-the-month program have continued tbis year under sponsorship of this Committee and tbe special Committee in charge of the program. The subjects were timely. They included Injuries of the Head and Spine (Oct., 1942), Immunization (Nov., 1942), Geriatrics (Dec., 1942), Use of Blood and Blood Substitutes (Jan., 1943), Rheumatic Fever (Feb., 1943), Control of Glaucoma (March, 1943), Recent Developments in Cancer (April, 1943), and Food Poisoning (May, 1943). The program is unique among medical associations and should be of even greater importance to the practicing physician as wartime demands inevitably restrict other avenues of postgraduate education.

Tbe Speakers' Bureau which has functioned ably for years under tbe chairmanship of Dr. F. H. Magney has been forced by the war to cancel or postpone most of its activity.

The reason is obvious and three-fold. Many of the most popular speakers have gone into military service. Those who might take their places are so much occupied with increased demands of practice that they cannot spare tbe time for such activities. Transportation difficulties have made travel for this purpose almost out of the question.

College Lectures were cancelled for this year, on that account, and tbe standing request to supply speakers on the subject-of-tbe-month withdrawn. Occasional requests are filled if possible through the State Office.

E. L. Tuohy, M.D., *Chairman*

REPORT OF RADIO COMMITTEE

William A. O'Brien, M.D., the spokesman for the radio committee of the Minnesota State Medical Association, now represents the medical, dental, and hospital professions, and tbe University of Minnesota, School of the Air. The medical programs are given each Saturday except the last Saturday of tbe month over Station WCCO, 10:15 a.m., and repeated over Station WLB, same day at 11:30 a.m. The last Saturday of each month, the same times are used by the Minnesota State Dental Association. The Minnesota Hospital Association broadcasts are heard the fourth Monday of each montb at 4:30 p.m., WCCO. The University of Minnesota, School of the Air for junior high scbool students is heard during tbe school year at 11:00 a.m. every Wednesday over Station WLB and 10 stations on the Mutual System.

The medical programs during the months of October to May inclusive are correlated with the packet of information distributed to the profession hy Minnesota State Medical Association and now to the Hospital Association members by the Minnesota Hospital Association. This plan has proven successful in interesting the public and profession alike in the same subject. Radio station WCCO continues to give time without pay at the same time each week; also WLB. It has heen difficult through the years to keep one time clear. It now results in transcribing radio programs which come through at this time and broadcast ing them later. Our Association has had uninterrupted radio service for fifteen years, starting April 4, 1928. Radio station WLB has been carrying our programs for the past five years. The School of the Air Program bas been on for tbe past four years. The medical profession should be grateful to tbese stations for many courtesies and privileges over the years. Our programs apparently reach individuals in all age groups in all sections of the state. The members of the Minnesota State Medical Association have been an important factor in the success of our service. Without their unqualified support and interest, the program would not have been received by the people. Tbe profession has understood wben people have come to them witb unusual versions of what they have beard on the air. In the final analysis the success of the program has been the result of the friendly interest of our physicians.

R. M. Burns, M.D., *Chairman*

Doctor Piper: The Committee recommends acceptance of the Radio report and suggests that appreciation be extended to Dr. W. A. O'Brien and the Chairman of the Committee for their fine work and also to the Broadcasting Stations for their more than generous contribution of time and facilities. The Editorial Committee and Speakers' Bureau reports are incorporated with the Report of the Committee on Public Health Education, which report is a résumé of activities of various scientific committees whose chairmen serve on its executive committee. We recommend its adoption and would like to call especial attention to the subject of conservation of hearing. We feel that this subject should be fostered by the Association. We recommend also that the Committee on Tuberculosis see that financial statements are published in local newspapers so that people can see where receipts of the sale of stamps have been expended. There has been some criticism by the public as well as other organizations on this matter. We feel that the Committee on Tuberculosis might formulate and adopt a standard financial statement for reports acquainting the public with disbursement of funds.

* * *

After considerable discussion from the floor it became evident that the Reference Committee had confused the Committee on Tuberculosis with the Christmas Seal organization with which it has no connection and, at the request of the Speaker, Dr. Piper withdrew his report with the understanding that a modified report would be submitted at a later session.

(To be concluded in October issue.)

Minneapolis Surgical Society

Meeting of April 1, 1943

President Richard R. Cranmer, M.D., in the Chair
Secretary R. F. McGandy, M.D.

ASEPTIC GASTRIC RESECTION FOR ULCER AND CARCINOMA

L. C. Culligan, M.D., F.A.C.S.
Minneapolis, Minnesota

Résumé

Peritonitis is the leading cause of death following resection for ulcer and carcinoma. A review of the literature for resection of stomach for ulcer showed that of 576 cases operated there were thirty-three deaths. Thirteen of these, or 39.4 per cent were due to peritonitis. In the collected series of 3603 resections for carcinoma of the stomach there were 522 deaths. Of these, 236, or 45 per cent, were due to peritonitis. From these figures it is apparent that peritonitis is the major cause of death following resection for both ulcer and carcinoma.

Contrasted with this is a series of approximately 410 resections for both ulcer and carcinoma done by the aseptic closed method. In this group there were two deaths attributable to peritonitis. One of these was due to subdiaphragmatic abscess following a difficult resection in which it was necessary to open the duodenum.

A method of aseptic resection of the stomach using the Furniss clamp is described. The advantages claimed by this method are :(1) simplicity; (2) better control of hemorrhage in that the clamp is removed prior to inversion of the cut edges into the lumen of the stomach cavity so that any spurter can be cauterized individually with the coagulating diathermy; (3) a narrow margin of inverted cuff produced by the thin blade of the Furniss clamp. Using this clamp a retrocolic Hoffmeister type of anastamosis is done, joining the end of the stomach to the jejunum by a short loop approximately two inches from the Ligament of Treitz. An additional point of interest in the technique is the use of an indwelling nasal suction tube onto which a metallic bucket is attached. This can be milked through the anastamosis into the proximal jejunal loop without breaking the aseptic technique. This eliminates the danger of pressure and tension on the duodenal stump and proximal jejunum.

Discussion

Dr. Owen Wangensteen: Dr. Culligan's nice presentation gives every evidence of intensive study of the problem of gastric resection. I am, naturally, very pleased to find in this community so ardent an advocate of the closed method of gastric resection. The point which Dr. Culligan makes with reference to the superiority of the aseptic method of gastric resection is well taken with reference to the lesser likelihood of peritoneal infection, especially in resection for gastric cancer.

The problem of gastric cancer, as it concerns the surgeon, is essentially a technical one apart from the item of preoperative preparation, the consideration of which would take us too far afield. Suffice it to say on that point that, the adequate preparation of patients who have obstruction at the gastric outlet is an item of the greatest importance for the safety of the patient, no matter whether the operation is undertaken for carcinoma or ulcer. The adoption of the closed method of gastric resection in the University Hospital clinic early in 1938 had a good deal to do with the reduction of operative mortality in gastric resection for cancer. As Dr. Culligan has indicated there has been universally a wide margin of difference in the hospital mortalities of resection for ulcer and carcinoma. Prior to 1933, there was a time when my own hospital mortality in aggressive resections for gastric cancer was not unlike some of the resection mortalities collected from the literature by Dr. Culligan. Chastened by the sobering effect of a study of my own poor results and the criticisms of my colleagues, I decided to limit resection to distinctly favorable cases of gastric malignancy. During the next thirty months, July 1933 to January 1936 (Journal Lancet, 75:1-4, 1937), resection was done in only 28.5 per cent of the patients explored, with considerable reduction in operative mortality (8.5 per cent). Emboldened by that experience, the indications for resection were extended considerably during the next four-year period; the resection rate mounted to 70.9 per cent with a rise of operative mortality to 20.5 per cent (Minnesota Med. 23:210, 1940). It has been very gratifying to note, therefore, that during the last three years, the resection rate has gone still higher, with a distinct lessening of the mortality. Two years ago, in a group of thirty-five gastric neoplasms, the resection rate was 88.5 per cent in the patients submitted to operation, and the resection mortality was 11.5 per cent (Surg. Gyn. & Obst., 72:257-281, 1941—see Table I and footnote on page 276). In the last report, covering a year's period (Arch. Surg., 1943, in press), the resection rate was 88.2 per cent and the hospital mortality was 7.8 per cent (three deaths in thirty-eight resections).

Our resection mortality for ulcer has been approximately 2 to 3 per cent. If the resections for massive hemorrhage are excluded, the operative mortality in the ulcer group is in the neighborhood of one per cent. Better preparation of the patients for operation, improved anesthesia, and the closed method of gastric resection has reduced the mortality of resection for both ulcer and carcinoma. Good surgical nursing and intelligent postoperative care have also been items of importance in reducing operative risks. At one time, I was inclined to believe that the disparities in operative mortalities of these two conditions was explicable largely on age differences in the two groups of patients. And to be certain, that consideration cannot be put aside wholly for patients with gastric malignancy, as a group, are distinctly older than a similar number of ulcer patients. Because of the compelling character of the indication for operation in gastric malignancy, the surgeon frequently is driven to accept poor and border-

line risks who, despite strenuous efforts at satisfactory preoperative preparation, continue to remain dubious operative risks—an item which serves to keep the resection mortality for cancer distinctly higher than for ulcer. Nevertheless I have the feeling that a high resection rate can be maintained in gastric cancer without pyramiding the mortality too much.

Dr. William J. Mayo, who lent an important impetus to a more aggressive surgical attitude toward gastric malignancy, was disposed to say that mortality for elective surgery should rarely exceed 10 per cent. Long before resection was performed generally for gastric malignancy with reasonably low mortality, the Mayo Clinic group of gastric surgeons was approximating the arbitrary standard for hospital mortality set by Dr. Mayo for elective surgery. In their recent monograph (1942) Walters, Gray and Priestley relate that the resection mortality in gastric malignancy over a twenty-five period (1907-1938) was 16.2 per cent; a remarkable achievement when one studies the general accomplishment with gastric malignancy during the same interval of time. The main problem, in gastric malignancy today, appears to be to recognize the presence of the lesion sufficiently early that radical surgery offering some hope of cure may be done.

Dr. Culligan alluded to reports suggesting that even extensive resections for ulcer were being followed by incidences of gastrojejunal ulcer as high as 10 per cent. Whereas it may be a matter of no importance what site in the jejunum is chosen by the surgeon for anastomosis with the residual gastric pouch in resections for carcinoma, this item becomes a factor of major importance in resections for ulcer. Elsewhere (Proc. Interstate Postgraduate Assembly 1942), I have discussed this problem at some length. It is to be remembered that, hydrochloric acid is normally the most important alimentary stimulus for the secretion of pancreatic juice. Secretin is found principally in the duodenal and upper jejunal mucosa. Contact of hydrochloric acid with duodenal muscosa permits absorption of secretin, in response to which pancreatic juice with high buffer value is secreted. Obviously, an anastomosis with a long jejunal loop in the Billroth II type of operation is distinctly out of place in gastric resection for ulcer in that contact between duodenal mucosa and gastric juice is precluded. Furthermore, such a long jejunal loop creates, in a sense, a reversed Mann-Williamson operation, in that, entry of bile and pancreatic juice into the bowel are far removed from the site of entry of gastric juice through the new stoma. It is our practice in resection for ulcer to make the anastomosis at the ligament of Treitz. We have now a group of patients, approximately 250 in number, who have undergone extensive resection for ulcer (three-quarter resection, group III or IVA operation (Arch. Surg., 44:489-500, (March) 1942), without the occurrence of gastrojejunal ulcer.

The ulcer problem with reference to choice of therapeutic procedure is by no means settled. Certainly, the patient who is getting on satisfactorily under medical management is not a candidate for surgery. Inasmuch as unsatisfactory operations for ulcer frquently leave the patient worse than he was before he sought surgical therapy, only operations which afford real promise of effective relief should be invoked in the surgical management of ulcer. A satisfactory operation for ulcer rids the patient of his ulcer diathesis and allows him free to make his own selection of food without the necessity of imposing dietary restrictions.

Dr. S. R. Maxeiner: I came in too late to hear all of Dr. Culligan's paper but I would like to take this opportunity to congratulate him on his presentation.

I have watched the development of this work as it has been practiced at the Veterans' Bureau. I have been through both stages during my twenty years as Consultant at the Veterans' Bureau and have noted great improvement in the end results and the healing of wounds with the aseptic technique. Several years ago I presented a review of gastric surgery before this Society, at that time based largely on the anastomosis without clamps. I stated that we had been using the aseptic technique in our colon surgery which I learned while with Dr. Farr but had not been using it in our surgery of the stomach.

When the aseptic technique is not used there is a much higher mortality in the carcinoma cases than in the ulcer cases because of the more virulent infection which abounds in the sloughing malignancies of the stomach. It is especially of note in reviewing the literature that without clamps even the gastro-enterostomy carries a very high mortality from fatal peritonitis in cancer of the stomach. There is no question in my mind but what this procedure is a great advance but will accomplish its greatest results in malignancies where the mortality from peritonitis is the highest.

We have subscribed to the aseptic technique as described by Dr. Wangensteen who undoubtedly should receive credit for its present popularity. The use of the Furness clamp as described by Dr. Culligan seems to us the most simple method and extremely satisfactory.

It has been a pleasure to hear Dr. Culligan's presentation and see his illustrations.

Dr. F. R. Sedgley (by invitation): We have just heard a very excellent paper by Dr. Culligan. During the recent annual E. Starr Judd lecture at the University of Minnesota, the guest speaker, Professor Blalock of Johns Hopkins, paid Dr. Wangensteen a very high compliment, naming him as the leader in the advancement of modern physiological surgery.

Being at the time acquainted with the general quality of Dr. Culligan's work, and of the preparation of this paper, the thought occurred to me that Dr. Wangensteen has a very worthy disciple in Dr. Culligan. Hearing the finished presentation of Dr. Culligan's paper tonight confirms me in the correctness of that idea.

Dr. A. W. Ide (by invitation): I appreciate the opportunity of hearing this splendid paper. The speaker has very thoroughly described the technique that he uses in resection of the stomach. This naturally brings up many points that could be discussed with profit. One point that impressed me particularly was his success in the use of the posterior gastro-enterostomy. This, in our experience, has been at times somewhat difficult and it has seemed best occasionally to use the anterior gastro-enterostomy although I agree that the posterior method ordinarily is much to be preferred.

I was particularly impressed with Dr. Culligan's remark about "The chap who smoked like a steam engine and drank like a fish" after a stomach resection. If we, as surgeons, could possibly follow these cases and direct their postoperative treatment until they have established a proper regime, we would undoubtedly improve our results. As surgeons we are pretty apt to turn these patients over to others for guidance.

It has been a pleasure for me to be with you tonight and to hear your discussion of this important subject.

RUPTURE OF THE LONG HEAD OF THE BICEPS BRACHII

R. C. WEBB, M.D.

Minneapolis, Minnesota

War workers in the home front factories are working strenuously, and this may be the cause of our seeing some very rare and unusual injuries as well as

the more common injuries. The biceps brachii muscle is frequently pointed to with pride as a criterion of muscular power and strength, and we give little thought to its three bony attachments. The long head of the biceps attaches to the upper border of the glenoid fossa of the scapula and to the glenoid ligament. The short head attaches to the tip of the coracoid process of the scapula. The distal attachment of the biceps is at the posterior border of the radial tubercle. The proximal tendons are exposed in all radical breast amputations. The short head of the biceps is least frequently injured. The distal tendon injuries make up only 3 per cent of the total injuries to the biceps tendons. The long head is most frequently injured. The long head leaves its attachment at the uppermost point of the glenoid margin and traverses the shoulder joint within the joint capsule but covered by the synovia. The tendon then follows the bicipital groove of the humerus and lies underneath the humeral attachment of the pectoralis major muscle.

Ruptures of the long head of the biceps brachii are stated to occur as the result of direct trauma such as blows and falls on the arm and from indirect trauma such as contractions of the muscle. Ruptures occasionally occur with shoulder dislocations.

Gilcreest in reporting on one hundred collected cases of rupture of this muscle in Surgery, Gynecology and Obstetrics for February 15, 1934 found thirty-four cases of rupture of the long head of the biceps within the joint, fourteen cases of rupture of the long head in its extra-articular portion and nine cases of disinsertion from its glenoid attachment. The case to be reported here is one of avulsion of the glenoid attachment of the long head of the biceps by indirect trauma.

Case Report

A man, aged thirty-one, by occupation a welder, was admitted to Northwestern Hospital in Minneapolis on December 7, 1942 after having injured his arm on December 5, 1942.

Past History.—He has been doing hard work for fifteen years at various jobs—farm, packing plant, auto repair, common labor. He has been welding for seven years and has been at the present job for sixteen months. He has never had any serious illness nor previous serious injury.

Present History.—He was pulling on a wrench, 3 feet long, loosening an inch and a quarter bolt. He had been doing this particular job for two days, loosening a dozen bolts each day. He had not previously performed this exact job until the last two days. He had to pull with one arm and steady himself with the other arm. He had given an especially hard pull and heard a snap in the right shoulder and felt a hot feeling in the right shoulder. The arm seemed heavy immediately after. It was twenty minutes before quitting time, and he continued to work. He only noticed that his arm felt a little lame. He didn't think anything special of it and thought his arm was just stretched a little. He went to Milaca immediately (Saturday night) to go ice fishing. His right shoulder was sore if he lay on it but otherwise he slept all right.

In the morning before he got up he felt his right arm and felt a hollow just below the deltoid and proximal to the biceps' belly. It felt stiff when he tried to move the shoulder, and it was sort of painful over the right deltoid region, when he moved, and this caused him to feel of it. He then got up and looked at it and noticed the difference in the two arms and called it to the attention of his friends. He decided not to fish but to consult a doctor.

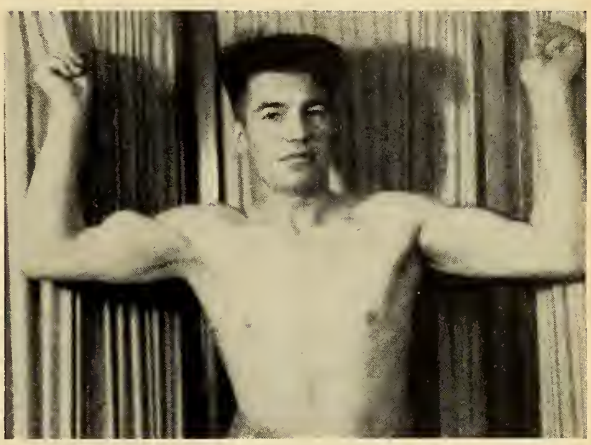


Fig. 1. Rupture of the long head of the biceps brachii of the right arm before operation.

He returned to work Monday morning and worked until 10:30, four and one-half hours. He was on the same job but did not loosen any bolts. The right arm was sore in the upper half in front whenever he lifted the arm. His right arm was always "heavy" in the region of the biceps muscle. The arm wanted to go down when he held anything in his hand up a little distance from the resting position. The arm did not feel good with the elbow straight. He kept the elbow bent and the hand in the bib of his overalls as much as he could. He was unable to move his 150 pound ladder for his scaffold because his right hand was not useable for heavy work. He could hold his electric welding rod and use his hand and forearm when supported. He could notice a snap and an awful pain in the right shoulder when he gave certain body twists or when he coughed.

Examination.—On examination of the right arm with the patient stripped to the waist (Fig. 1) there was an obvious bulging of the biceps muscle in the lower half of the arm. The point of maximum bulging on the affected right arm was 9.5 inches above the tip of the olecranon whereas the point of maximum bulging on the normal left arm was 10.5 inches above the tip of the olecranon. The circumference of the affected right arm at the belly of the muscle at rest was 12.5 inches while that of the normal left arm was 12 inches. With the biceps contracted the circumference of the affected right arm at the maximum point over the belly of the muscle was 14.5 inches whereas on the left normal arm the circumference was 13.5 inches with the biceps contracted. The right biceps muscle formed a spherical swelling when contracted, and it was dislocated toward the elbow end of the biceps muscle. The point of greatest tenderness on the right arm was about two inches below the acromial process over the deltoid muscle. With the arm hanging at the side of the body the patient was unable to abduct the arm more than 45 degrees because of pain in the shoulder, and he complained of feeling a snap in the deltoid region.

Operation.—December 9, 1942. An 8-inch incision was made on the anterior surface of the right arm up

to and over the deltoid muscle to the lower region of the clavicle. The incision was carried down to the fascia and the lateral edge of the biceps muscle was exposed and the pectoralis muscle was separated from the deltoid muscle in the region of the cephalic vein. The cephalic vein was ligated. When the lower medial margin of the deltoid muscle was separated from the biceps muscle the tendon of the long head of the biceps was found to be lying in this groove in a relaxed and slightly tortuous manner. There were no blood clots and there apparently had been a very small amount of hemorrhage which was not manifested until the biceps was separated from the lower margin of the deltoid. The attachment of the pectoralis muscle was not disturbed, but it was separated from the tendon of the short head of the biceps, and the short head of the biceps was exposed up to its attachment on the coracoid process of the scapula. The tendon of the long head of the biceps was then picked up and brought into view. It was necessary to pull slightly in order to pull the tendon out into the wound and examine the upper end. It was thought that there might possibly be only a partial rupture of the long head of the biceps with possibly a small strand remaining, but when the end was brought out into the wound it was found that there was a thin shell of bone attached to the end of the tendon where it had pulled away from the superior margin of the glenoid fossa, and as this came through the tendon sheath this shell of bone offered some resistance because of the knob-like formation.

The tendon of the long head of the biceps was then threaded up under the pectoralis major muscle attachment and brought alongside the tendon of the short head of the biceps. A buttonhole-like tunnel was made through the long head of the biceps. About one inch of the long head of the biceps was threaded through this tunnel to the coracoid process, and the long head of the biceps was again threaded through a second tunnel. The shell of bone on the end of the long head of the biceps was of definite assistance in preventing the muscle from retracting through these tunnels. The end of the tendon was then sutured to the coracoid process and to the biceps tendon by several interrupted fine silk sutures. Number two Deknatel silk was used for suturing the tendon. The wound was then irrigated thoroughly and bleeding points were ligated with fine silk. The wound was closed and the arm was suspended in acute flexion.

Progress.—The wound healed normally, and he left the hospital on December 16, 1942, and he returned to work on December 19, 1942, ten days after operation. He carried his right arm in a sling until February 1, 1943. After February 1, 1943, he performed the same duties as before injury, and on February 24, 1943 he stated that the arm felt good and that it didn't bother him except when he was lifting, when pains occurred in the region where the tendon was attached to the coracoid process. He states that the arm still felt "heavy" when he was holding his rod holder on his welding machine, but he was able to use the arm satisfactorily.

On April 1, 1943, he stated that he was doing his regular work. When he raises his arm above his head he has difficulty in straightening it completely at the elbow, and the biceps feels tight and too short, due to the fact that the tendon attachment has been transferred to a lower point on the scapula.

When the hand is pronated and the elbow flexed to a right angle the biceps feels and appears normal due to the fact that the radial tubercle is turned downward and the tendon is on a stretch.

When the hand is supinated and the elbow is at a right angle the biceps feels loose and bulges abnormally due to the fact that the radial tubercle is turned forward and the attachment is relaxed.

When he carries a pail of water he has a sensation over the point of the shoulder of lack of support and as though it were pulling out of joint.

RUPTURE OF THE LONG HEAD OF THE BICEPS MUSCLE OF THE ARM

Report of Case

O. W. YOERG, M.D., F.A.C.S.
Minneapolis, Minnesota

A. S., a pipe-fitter helper, aged seventy, on December 18, 1942, while walking, slipped on a sidewalk. He thinks he fell on the extended right arm. He felt severe pain in the shoulder but thought he had only sustained a bruising. He continued at work for two days but with difficulty due to weakness in the arm and soreness in the shoulder. He then discontinued work and came to my office for relief four days after the accident.

Examination of the right arm disclosed typical symptoms of rupture of the long head of the biceps muscle. The belly of the muscle was displaced downward forming a tumor mass. This mass had a boggy feeling was freely movable, and only slightly tender. The muscle, when contracted, became more prominent and firm. Extension of the arm decreased the size of the tumor but it did not entirely disappear. There was a definite point of tenderness at the origin of the tendon at the tip of the head of the humerus but only slight soreness on movement of the shoulder. Power of flexion and supination were markedly diminished.

The patient entered Northwestern Hospital the following day and six days after the injury the arm was operated upon.

An incision was made from the top of the shoulder beginning at the inner margin of the deltoid muscle and extending downward along the outer margin of the biceps muscle to the middle of the arm. The ruptured tendon was found curled up in the lower portion of the wound. The tendon was short and frayed, indicating a rupture of the tendon extracapsularly. The torn end of the tendon was then carried up under the pectoralis major muscle near its insertion and through a slit made in the tendon of the short head of the biceps and sutured with silk to the coracoid process and to the tendon of the short head. The wound was closed and a posterior plaster splint was applied with the elbow at right angles. The plaster splint was removed two weeks later and the arm carried in a sling. Passive motion was begun and the sling discarded and active motion allowed six weeks after the operation.

The patient, now three months after the operation has recovered except for moderate stiffness in the shoulder due to nonuse.

A demonstration of the functional end result was given by both Dr. Webb's and Dr. Yoerg's patients and a colored motion picture film was shown by Dr. Yoerg disclosing the technique of the operative procedure in this case.

Discussion

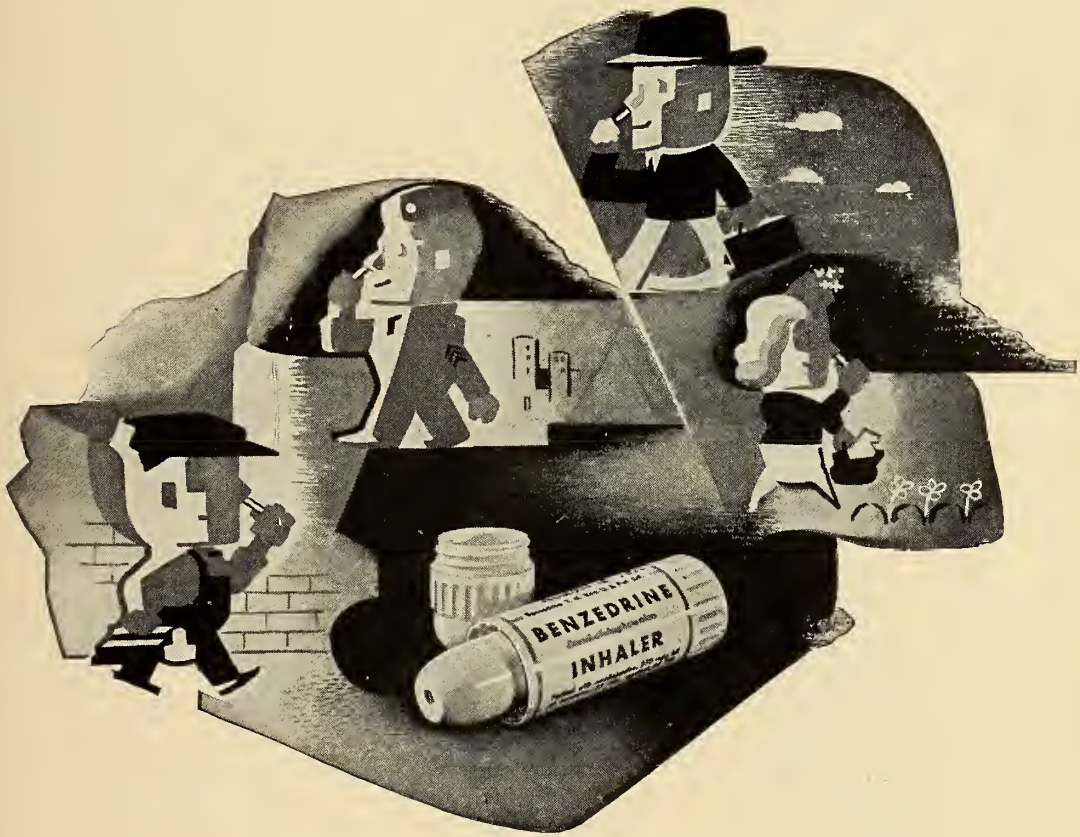
DR. KENNETH BULKLEY: Did you attach that also to the coracoid?

DR. O. W. YOERG: Yes, we did. The tear in the tendon was extracapsular, rather short, while Dr. Webb's was an avulsion from its origin at the glenoid.

So Outstandingly Convenient

that the physician may overlook the fact that it is,

first and foremost, a highly effective therapeutic agent.



Benzedrine Inhaler

In a Modern Plastic Tube

Each Benzedrine Inhaler is packed with racemic amphetamine, S.K.F., 250 mg.; oil of lavender, 75 mg.; and menthol, 25 mg. Benzedrine is S.K.F.'s trademark, Reg. U. S. Pat. Off., for their Inhaler and their brand of racemic amphetamine.

SMITH, KLINE & FRENCH LABORATORIES, PHILADELPHIA, PA.

KARO is KARO whether the label is Red or Blue

Your patients may have a preference for either Red Label *or* Blue Label KARO. If their grocers are temporarily out of their favorite flavor, you may assure them that *flavor* is the only difference between these two types of KARO for infant feeding.

Each contains practically the same amount of dextrins, maltose and dextrose so effective for milk modification.



How much KARO for Infant Formulas?

The amount of KARO prescribed is 6 to 8% of the total quantity of milk used in the formula—one ounce of KARO in the newborn's formula is gradually increased to two ounces at six months.

CORN PRODUCTS REFINING CO.
17 Battery Place • New York, N. Y.

In Memoriam

LAWRENCE F. DUGAN

Dr. Lawrence F. Dugan of Faribault died July 17, 1943, after an illness of two and one-half years.

Dr. Dugan was born in Minneapolis, July 14, 1898. When a small boy his family moved to Mondovi, Wisconsin, where he received his early schooling. His medical degree was received from the Marquette Medical School, Milwaukee, 1924. While a student during World War I he was a member of the R.O.T.C. and later was a member of the American Legion.

During his senior year at medical school he held a senior internship and following graduation served one year as Resident in Medicine and a second year as Resident in Surgery at the Milwaukee County Hospital at Wauwatosa, and six months as Resident in Surgery at Emergency Hospital, Milwaukee.

After two and one-half years' practice in Minneapolis, Dr. Dugan moved to Faribault in 1930 where he continued to practice until his final illness.

Dr. Dugan was a member of the Rice County Medical Society, the Minnesota State and American Medical Associations, the Knights of Columbus and the Catholic Order of Foresters.

He is survived by his widow, the former Molly Malone of Owatonna, a brother, Dr. Bernard J. Dugan, Minneapolis, and a sister, Katherine Dugan of Faribault.

GEORGE J. GORDON

Dr. George J. Gordon, Jewish leader in Minneapolis and founder of Talmud Torah and other Jewish organizations, died July 25, 1943, at the age of sixty-nine. Dr. Gordon was born at Neustadt, Lithuania in 1874, and came to the United States in 1892. He received his medical degree at Jefferson Medical College, Philadelphia in 1900, and came to Minneapolis soon thereafter. In 1929, Dr. Gordon gave up the practice of medicine and took over the educational directorship of Talmud Torah, which he had founded in 1911, but which had been an avocation up to that time. Talmud Torah was founded as a school to supplement public schools with religious education for Jewish children. Because of his work for the interests of the Jewish community, Dr. Gordon was cited as "outstanding Jew of the city" by the Jewish War Veterans Organization in 1941. Dr. Gordon also founded the Jewish Family Welfare Society. He was a director of the Northwestern Home for the Aged, the Emanuel Cohen Center, and the Deinard Memorial Library. He was a former member of the Hennepin County Medical Society and the Minnesota State and American Medical Associations. Dr. Gordon is survived by his wife and four children: Grace Gordon of Rochester, Minnesota; Mrs. David M. Birnberg and Mrs. Joseph Seltz, both of Minneapolis; and Rabbi Theodore H. Gordon of Madison, Wisconsin.

ANDREW RICHARD JOHNSON

Dr. A. R. Johnson of Isanti, Minnesota, died July 25, 1943, in Minneapolis following an operation.

Dr. Johnson was born in Saint Paul, April 23, 1899. He graduated from Central High School, Saint Paul, and received his M.D. from the University of Minnesota Medical School in 1928. Following his internship at the Minneapolis General Hospital, he joined the More Clinic at Eveleth for two years.

Dr. Johnson married La Verne Delores Slater of Northfield in 1931, and moved to Isanti, where he remained in general practice until his untimely death.

Dr. Johnson was a member of the Asbury Hospital Staff, Minneapolis, the Saint Louis County Medical Society, the East Central Medical Society, the Minnesota State and American Medical Associations. He was active in county and social affairs, and hunting and fishing were among his hobbies. He served well his community as medical advisor and friend.

Dr. Johnson is survived by his widow, and two sons, Alan and Paul.

CEPHAS SWANSON

Dr. Cephas Swanson of Minneapolis died in July at the age of sixty-seven. Dr. Swanson was born in Carver County, Minnesota, January 30, 1876. He graduated from Gustavus Adolphus College, Saint Peter, Minnesota in 1902, and from the University of Minnesota Medical School in 1907. He practiced at Saint Hilaire, Minnesota, from 1907 until 1919, when he moved to Minneapolis. He served as head physician for the Scandinavian American Fraternity.

MERLE O. THORESON

Dr. Merle O. Thoreson was born in Zumbrota, Minnesota, in June, 1905. He graduated from Zumbrota High School and St. Olaf College in Northfield, Minnesota, in 1924, with an A.B. Degree. In 1929 he graduated from the University of Minnesota Medical School receiving his Bachelor and Doctor of Medicine. While at the University of Minnesota he was an honor student and was a member of A. O. A. and Phi Chi Fraternities.

He had his internship at Ancker Hospital in 1932. In 1933 he finished his residence at Ancker in Medicine and Surgery. On March 22, 1932, he married Dr. Bernice Figenshau, who graduated from the University of Minnesota Medical School in 1932. They have two sons, Jon, two years old and James, seven months. In 1933, after leaving Ancker Hospital, they practiced medicine in Saint Paul, Minnesota, until 1939, at which time they moved to South Saint Paul, Minnesota. He had been on the Medical Staff at Swift and Company in South Saint Paul for the past eleven years.

He was a member of the Masonic Lodge No. 3, A. F. & A. M. Saint Paul and Minnesota Consistory of Scottish Rites and of the Osman Shrine Temple of Saint Paul. He was also a member of the South Saint Paul Civic and Commerce Associations and of the Junior Chamber of Commerce. He was also an active member of the Arrow S Club of Swift and Company.

"Kewp," as he was known by all his many friends,

MANY DOCTORS TELL US

SPENCER

POSTURE IMPROVEMENT AND SUPPORT

Further Their Treatment of . . .



Woman with lordotic posture before —and after—wearing a Spencer.

Convalescence
Excess Fatigue
Low Vitality

Visceroptosis
Nephroptosis
with Symptoms

Maternity
Postoperative
Postpartum

Hernia

Cardiac Syndrome

Breast Problems

We also design supports for: Intervertebral Disc Extrusion and other back injuries and diseases

Patients respond mentally and physically to the gentle, yet *positive* support and posture-improvement a Spencer effects. Doctors note that patients enjoy a comforting sense of well-being and confidence which renders them more responsive to treatment. The neurotic and "complaining" type of patient is less likely to make excessive demands on the doctor's time.

As each Spencer Support is individually designed, perfect fit and comfort are achieved. The doctor is not annoyed by complaints of patient dissatisfaction. Because each Spencer is individually designed it is *guaranteed* never to lose its shape. A support that stretches out of shape becomes useless before worn out.

Spencers are never sold in stores. For a Spencer Specialist, look in telephone book under "Spencer Corsetiere" or write direct to us.

SPENCER *INDIVIDUALLY DESIGNED*

Abdominal, Back and Breast Supports

SPENCER INCORPORATED,
137 Derby Ave., New Haven 7, Conn.
In Canada: Rock Island, Quebec.
In England: Spencer (Banbury) Ltd., Banbury, Oxan.

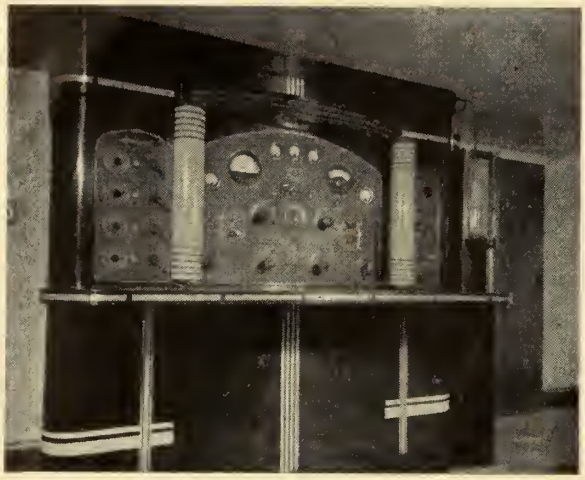
May We Send You Booklet?

Please send me booklet, "How Spencer Supports Aid the Doctor's Treatment."

.....M. D.

Address O-9

Radiation Therapy Institute



Control Board

of Saint Paul

CHARLES T. MILLER HOSPITAL

Facilities for Radium and Roentgen Therapy, Including Million Volt Constant Potential Installation of Most Advanced Design.

You are cordially invited to visit the Radiation Therapy Institute and inspect its facilities

Edward Schons, M.D., *Director* J. P. Medelman, M.D., *Associate Director*

was an excellent doctor and a real fellow, a professional associate, and a personal friend, and all the workers in Swift and Company and all his patients never had anything but the best to say about him. It might be said that he shortened his young and active life by continuous hard work at his practice and in caring for his new home that had just been completed in 1942.

Besides being a good physician and a good surgeon he was an enthusiastic worker in civic affairs. He was a real sportsman, having been active in many forms of athletics in his younger life and lately having spent considerable time in hunting and fishing on Minnesota lakes.

His sudden and untimely death came as a severe shock to everyone. His passing is a tremendous loss to all who knew him, to the community and to the profession.

H. R. Tregilgas, M.D

* * *

FRANK EUGENE TOWERS

Dr. Frank E. Towers, one of the oldest physicians of Hennepin County, died June 1, 1943, in Minneapolis at the age of ninety-two. Dr. Towers was born March 6, 1851, on a farm near Burlington, Vermont. He received his medical degree from New York University Medical College in 1875. He was Hennepin County coroner during the eighties and nineties and was a former president of the Hennepin County Medical Society. His wife, Dr. Mary Towers, a widely-known physician of Minneapolis, died sixteen years ago.

MINNESOTA PUBLIC HEALTH ASSOCIATION

(Continued from Page 818)

In this brief article, only the highlights in our program have been mentioned.

As a voluntary organization the Minnesota Public Health Association coöperates with all agencies, official and non-official, and aims to aid and supplement their health programs. All possible assistance is given to the Committee on Tuberculosis of the Minnesota State Medical Association in all of its work, especially in promoting the Accreditation of counties and the Meeker County project.

In the campaign for the prevention of tuberculosis all other diseases are fought. At the same time people are told how to avoid tuberculosis, they receive information on how to kill germs, on the importance of the periodic medical examination, on the prevention of the common cold and other communicable diseases, on the need for sufficient rest, on cleanliness, proper nutrition and good posture.

With the world at war, the problem of tuberculosis in our state may not seem vital. Our country, of course, needs money, machines, material and men. But men need health if the nation is to survive. War and tuberculosis go hand in hand. More than ever today the fight against tuberculosis needs the medical leadership, vision, courage, coöperation and generosity which have brought it thus far.

Of General Interest

Lt. D. A. Thysell of Minneapolis is now stationed at the Navy Base Hospital at Waukegan, Illinois.

* * *

Dr. R. V. Williams has moved from Rushford, Minnesota, to Michigan City, Indiana, where he is associated in group practice with The Clinic, Incorporated.

* * *

Dr. F. B. Schleinitz, who is serving with the 369th Engineers Regiment (S.S.) was recently promoted from First Lieutenant to Captain.

* * *

Dr. T. J. Bloedel of Gaylord, who has been practicing in Glencoe for the past several months, has returned to Gaylord to resume his former practice.

* * *

Dr. R. E. Hultkrans left Minneapolis to join the staff of the Army and Navy Hospital at Hot Springs, Arkansas.

* * *

The state law requiring school buses to carry splints and the training of drivers of such buses in their use was repealed March 29, 1943.

* * *

Dr. Donald C. Balfour of Rochester has received notification from London that he has been elected Honorary Fellow of the Royal Society of Medicine.

Dr. C. J. Martinson of Wayzata is now located in his new building, the Martinson Clinic, at the intersection of Wayzata Boulevard and Barry Avenue.

* * *

Dr. Erhart E. Zemke of Fairmont, who is now serving in the Army Medical Corps, was recently promoted from the rank of first lieutenant to captain.

* * *

Lieutenant Colonel Richard Hullsiek has recently been transferred and placed in charge of urology at the Station Hospital of the Aberdeen Proving Ground, Maryland.

* * *

Dr. Harold E. Wilmot of Litchfield was married August 12, 1943, to Clara Lenore Draxton, daughter of Mr. and Mrs. Anton J. Draxton, at the Trinity Episcopal Church in Litchfield. Dr. and Mrs. Wilmot are now at home in Litchfield.

* * *

Dr. Gilbert J. Thomas, formerly associated with the Nicollet Clinic, Minneapolis, has moved to Los Angeles, where he will continue the practice of urology with the Moore-White Clinic.



From the painting by George FrederickWatts, "HOPE"

AS EVER-GROWING numbers of cases yield to liver therapy, pernicious anemia emerges from among the one-time "incurables." Today, men and women who must, can face this condition with justifiable optimism—for there is hope . . .

And so the laboring physician has two allies—a proven medicinal, and the fighting spirit of his patient.

When his choice of a liver product falls upon Purified Solution of Liver, Smith-Dorsey, he may count a third ally—the dependability of the maker. For Smith-Dorsey's product comes from laboratories capably staffed . . . equipped to the most modern specifications . . . geared to the production of a strictly standardized medicinal.

In that especially critical anemia case—as in all the others—you need a product of the caliber of

Purified Solution of

Liver

SMITH-DORSEY

Supplied in the following dosage forms: 1 c.c. ampoules and 10 c.c. and 30 c.c. ampoule vials, each containing 10 U.S.P. Injectable Units per c.c.

The
SMITH-DORSEY COMPANY LINCOLN NEBRASKA

Manufacturers of Pharmaceuticals to the Medical Profession since 1909



Accident, Hospital, Sickness

INSURANCE

For ethical practitioners exclusively
(57,000 Policies in Force)

$5,000.00 accidental death $25.00 weekly indemnity, accident and sickness	For **$32.00** per year
$10,000.00 accidental death $50.00 weekly, indemnity, accident and sickness	For **$64.00** per year
$15,000.00 accidental death $75.00 weekly indemnity, accident and sickness	For **$96.00** per year

ALSO HOSPITAL EXPENSE FOR MEMBERS, WIVES AND CHILDREN

41 Years Under the Same Management

$2,418,000.00 INVESTED ASSETS

$11,750,000.00 PAID FOR CLAIMS

$200,000 deposited with State of Nebraska for protection of our members.

Disability need not be incurred in line of duty—benefits from the beginning day of disability.

86c out of each $1.00 gross income used for members' benefit

PHYSICIANS CASUALTY ASSOCIATION
PHYSICIANS HEALTH ASSOCIATION
400 First National Bank Building OMAHA 2, NEBR.

Dr. B. I. Saliterman of Minneapolis, formerly of Janesville, has left for the armed forces to serve as Captain at the Hospital Base at the Presidio, San Francisco, California.

* * *

The new county physician for the third commissioner's district is Dr. C. R. Chadbourn of West Saint Paul. He is taking the place of Dr. B. J. Mears, who was called into military service.

* * *

Dr. J. J. Kolars and family left Le Center last month to be in Fayetteville, Arkansas, where Dr. Kolars will continue his practice and do research work at the University. He has practiced in Le Center fifteen years.

* * *

Lieutenant J. E. Minckler, of the U. S. Army Air Corps, with Mrs. Minckler, recently spent a week's furlough with his parents at Buhl, Minnesota, after which he reported to McCook, Nebraska, for further service as a flight surgeon.

* * *

Dr. W. G. Benjamin of Pipestone was recently appointed chairman of the Pipestone County Nursing Advisory Board and is to serve a three-year term there. He is succeeding Dr. E. F. McElmeel, who left Pipestone to take special work at the Medical School of the University of Minnesota.

* * *

Dr. Carle B. McKaig of Pine Island was elected president of the Southern Minnesota Medical Association at the annual meeting held in Austin, August 23. Dr. C. M. Robilliard of Faribault and Dr. C. L. Sherman of Luverne were elected vice presidents and Dr. Austin C. Davis of the Mayo Clinic, Rochester, was reëlected secretary-treasurer.

* * *

Appointment of Dr. E. S. Mariette as chief of emergency medical service for rural Hennepin County has been announced by Roy W. Hollander, rural Hennepin Civilian Defense chairman. Dr. Mariette succeeds Dr. Gilbert J. Thomas, who has moved his practice from Minneapolis to Los Angeles, California. Dr. Mariette is superintendent of Glen Lake Sanitarium.

* * *

Dr. Roger P. Hentz, manager of the Saint Cloud Veterans Administration Facility since February 1, 1939, has been transferred to a similar position at the Fort Custer Veterans Facility at Battle Creek, Michigan. He assumed his new duties on September first. Slated to succeed Dr. Hentz at the Saint Cloud Facility is Dr. John A. Pringle, assistant medical director at The Veterans Administration, Washington, D. C.

* * *

The recent purchase of the late Dr. Charles Swenson's residence at Braham, Minnesota has made available additional bed facilities in the Braham Hospital. The home is to be used for housing accommodations for nurses and other hospital employes. This arrangement will increase the capacity of the hospital to twenty-five more beds for patients, relieving to some extent the present crowded conditions. Two vacant lots east of the hospital have been purchased to provide additional ground space.

On August 1, the Pokegama Sanatorium for tubercular diseases closed for the duration of the war. Because of the difficulty in obtaining nurses and maintaining help, the H. Longstreet Taylor Foundation, operators of the hospital, decided to close it until after the war. The sanatorium was founded by Dr. Taylor and Dr. R. L. Wiseman in 1905, and it now has a national reputation for the treatment of tuberculosis. Dr. F. F. Callahan was resident doctor in charge until last year, when he was appointed superintendent of the state hospital at Walker, Minn. He had been with the hospital since 1919.

* * *

Fifteen Minnesota physicians have been appointed by Governor Thye to serve on the medical panel provided by the last Legislature to help decide medical questions arising in workmen's compensation cases. Appointees, who will serve until February 1, 1945, are the following: Drs. A. J. Aurelius, C. B. Drake and F. W. Lynch, Saint Paul; H. R. Tregilgas, South Saint Paul; R. G. Allison, J. A. Myers and A. E. Wilson, Minneapolis; F. J. Elias and J. R. McNutt, Duluth; W. S. Lemon and C. G. Sutherland, Rochester; A. J. Wentworth, Mankato; W. E. Wilson, Northfield; B. S. Adams, Hibbing; B. J. Branton, Willmar.

* * *

Dr. Charles W. More of Eveleth, one of the oldest practicing physicians in Minnesota, has announced his retirement from active hospital management and a transfer of the More Hospital to a group of three East Mesaba Range physicians, namely—Dr. Harry B. Ewens of Virginia; Dr. F. R. Kotchevar of Eveleth, who has been associated with the More Hospital for the past fifteen years, and Dr. M. L. Strathern of Gilbert, who has been chief of staff of the More Hospital since 1940. Dr. More will continue his private practice, maintaining an office at the hospital.

* * *

The National Foundation for Infantile Paralysis has established a special polio unit at the University of Minnesota. The unit will be devoted to the study of the physiological problems associated with the disease and with methods of treatment.

A grant of $175,000 was made to the University for the five-year period, July 1, 1943, to June 30, 1948. Building space and laboratory facilities are already available, and the unit will be under the direction of a committee composed of members of the departments of physiology, neuropsychiatry, and pediatrics in the Medical School with Dr. Maurice B. Visscher, head of the Department of Physiology, in charge of administration.

This unit is one of four major long-range research projects in connection with poliomyelitis undertaken during the past year by the National Foundation.

* * *

Officers and Council members of the Minnesota State Medical Association joined with officers of the Hennepin County Medical Society and many friends from all parts of the state to give a farewell dinner, Sunday, August 15, to Dr. James M. Hayes who left Minneapolis recently to make a permanent home in California.

The dinner was held at the Hotel Radisson in Min-

PROFESSIONAL PROTECTION



In addition to our Professional Liability Policy for private practice we issue a special
MILITARY POLICY
to the profession in the Armed Forces at a
REDUCED PREMIUM

THE
MEDICAL PROTECTIVE COMPANY
OF
FORT WAYNE, INDIANA

Cook County
Graduate School of Medicine
(In Affiliation with Cook County Hospital)
Incorporated not for profit
ANNOUNCES CONTINUOUS COURSES

SURGERY—Two Weeks' Intensive Course in Surgical Technique starting September 6 and 20, October 4 and 18, and every two weeks throughout the year.

MEDICINE—Two Weeks' Intensive Course starting October 4. One-month Course in Electrocardiography and Heart Disease.

FRACTURES & TRAUMATIC SURGERY—Two Weeks' Intensive Course starting October 18.

GYNECOLOGY—One-week Personal Course in Vaginal Approach to Pelvic Surgery starting November 1. Clinical and Diagnostic Courses.

OBSTETRICS—Two Weeks' Intensive Course starting October 4.

ANESTHESIA—One-week Course in Continuous Caudal Anesthesia for Obstetrics.

OPHTHALMOLOGY—Two-weeks' Intensive Course starting September 27. Course in Refraction Methods, October 11.

OTOLARYNGOLOGY—Two Weeks' Intensive Course starting September 13.

ROENTGENOLOGY—Courses in X-Ray Interpretation, Fluoroscopy, Deep X-Ray Therapy every week.

UROLOGY—Two Weeks' Course and One-month Course available every two weeks.

CYSTOSCOPY—Ten-day Practical Course every two weeks.

General, Intensive and Special Courses in All Branches of Medicine, Surgery and the Specialties.

TEACHING FACULTY — ATTENDING STAFF OF COOK COUNTY HOSPITAL

Address: Registrar, 427 S. Honore St., Chicago, Ill.

Excellence in War Production



FOR supplying Mercurochrome and other drugs, diagnostic solutions and testing equipment required by the Armed Forces, for developing and producing Sterile Shaker Packages of Crystalline Sulfanilamide especially designed to meet military needs, and for completing deliveries ahead of contract schedule—these are the reasons for the Army-Navy "E" Award to our organization.

The effectiveness of Mercurochrome has been demonstrated by more than twenty years of extensive clinical use.

For the convenience of physicians Mercurochrome is supplied in four forms—Aqueous Solution for the treatment of wounds, Surgical Solution for preoperative skin disinfection, Tablets and Powder from which solutions of any desired concentration may readily be prepared.

Mercurochrome (H. W. & D Brand of dibrom-oxymercuri-fluorescein-sodium) is economical because stock solutions may be dispensed quickly and at low cost by the physician or in the dispensary. Stock solutions keep indefinitely. Literature furnished to physicians on request.



HYNSON, WESTCOTT & DUNNING, INC.
BALTIMORE, MARYLAND

neapolis. Talks by President Stephen H. Baxter of the State Association and Dr. W. A. O'Brien, of the University of Minnesota, featured the program which included a series of amusing skits based upon incidents of Dr. Hayes' career in Minnesota and the presentation of gifts from officers of both organizations. Dr. Willard D. White of Minneapolis, president of the Hennepin County Medical Society, acted as master of ceremonies.

During twenty-two years in the practice of surgery in Minneapolis, Dr. Hayes served in many responsible offices in the county and state societies and in other special societies. He was president of the Hennepin County Society and councilor, then president and finally, delegate of the State Association to the American Medical Association. He plans to continue his practice at Monrovia, California, in association with his brother, Dr. Edward Hayes.

ASSOCIATION OF MILITARY SURGEONS

The fifty-first meeting of the Association of Military Surgeons promises to be an important medical meeting of the year when it convenes for a three days' session in the Bellevue-Stratford Hotel in Philadelphia, October 21, 22 and 23.

It is expected that some 2,000 doctors from all parts of the country and many who have seen active service in all parts of the globe will be present. The symposium on war medicine should be of general value and interest. There will be reports and discussions on such new matters as air evacuation, parachute injuries, the physiological effects of high altitude flying and dive bombing, tropical medicine, blast injuries, amphibious operations, submarine warfare, inversion and temperature extremes, neuro-surgical problems and the whole field of rehabilitation.

Rear Admiral William L. Mann of Seattle is president of the Association. On "Navy Night" Rear Admiral Ross T. McIntire, Surgeon General of the Navy, will preside, and the Hon. Frank Knox, Secretary of the Navy, will speak.

Further information may be obtained from the Publicity Office of the Association, Room 603, 1520 Locust Street, Philadelphia, Pennsylvania.



Largest Orthopedic Manufacturers in the Northwest

SPECIALISTS!

Extension Shoes and Clubfoot Corrections . . . Abdominal and Arch Supports . . . Braces for Deformities . . . Elastic Stockings . . . Expert Truss Fitters . . .

•

Seelert Orthopedic Appliance Company

88 South 9th Street

Minneapolis MAin 1768



REST HOSPITAL

A quiet, ethical hospital with therapeutic facilities for the diagnosis, care and treatment of Nervous and Medical cases. Invites cooperation of all reputable physicians who may supervise the treatment of their patients.

PSYCHIATRISTS IN CHARGE
Dr. Hewitt B. Hannah
Dr. Joel C. Hultkrans

2527 2nd Ave. S., Minneapolis, Phone At. 7369



The Birches Sanitarium, Inc.

2391 Woodland Avenue

Duluth, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Psychiatrists in Charge

L. R. Gowan, M.D. **A. S. Nissen, M.D.**



VOCATIONAL HOSPITAL

. . . An integral part of the Miller Vocational High School offers two special features—Patients receive a maximum of personal attention from student practical nurses—All food is prepared under the direction of a qualified dietitian. Patients remain under the care of their own physicians.

Director of Nurses—M. H. WOLTMAN, R.N., B.S.
Superintendent & Dietitian—H. B. BROWN, B.S.

Physicians may secure services of Vocational nurses by calling Nurses Headquarters and asking for a Vocational Nurse

Bridgeport 2281

5511 South Lyndale - - Minneapolis

DANIELSON MEDICAL ARTS PHARMACY, INC.

PHONES:
ATLANTIC 3317
ATLANTIC 3318

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

HOURS:
WEEK DAYS—8 to 7
SUN. AND HOL.—10 TO 1

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.

414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.

INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS

MAIN 2494

VIM
Registered U. S. Pat. Off.

SYRINGES AND NEEDLES

OF

LASTING QUALITY

Distributed by

BROWN & DAY, Inc.

St. Paul, Minnesota

CLASSIFIED ADVERTISING

WANTED—An associate general practitioner, draft exempt. Iowa town of 9,000. Salary $500 a month. Address D-56, care MINNESOTA MEDICINE.

FOR SALE—One year old G. E. F-3, 15 mille amp. portable x-ray, complete with suitcase and office stand, $500. L. L. Kallestad, M.D., P. O. Box 1111, Knoxville, Tennessee.

SAINT PAUL PHYSICIAN has opening for office assistant with laboratory experience. Graduate nurse preferred. Address D-58, care MINNESOTA MEDICINE.

POSITION WANTED—Technologist, recent Minnesota graduate, wishes laboratory position, preferably institutional with maintenance. Address D-59, care MINNESOTA MEDICINE.

FOR SALE—$18,000 practice. Town of 2400, Southern Minnesota. New modern, open hospital. Basal machine. Full line surgical instruments including new B.B. cystoscope. Laboratory including blood chemistry. Heidbrink gas machine. New 30 milliampere, built-in Bucky x-ray. Modern suite, six well furnished rooms. 160-volume library. Complete refracting equipment, including B & L refractoscope. Streak retinoscope, phoropter, et cetera. Overhead low. Will introduce. Address D-57, care MINNESOTA MEDICINE.

Complete Optical Service

LENS GRINDING
DISPENSING
CONTACT LENSES
EYE PHOTOGRAPHY

N. P. Benson Optical Co., Inc.

Established 1913

Main Office: Minneapolis, Minn.

— BRANCHES —

Aberdeen - Duluth - Eau Claire - Winona
Bismarck - La Crosse - Wausau - Stevens Point
Albert Lea - Rapid City

Social and Educational Adjustment

for exceptional children of all ages. Visit the school noted for its work in educational development and fitting such children for more normal living. Beautiful grounds. Home atmosphere. Separate buildings for boys and girls.

Catalog by request.

The **MARY E. POGUE SCHOOL**

124 GENEVA ROAD WHEATON, ILL.
(NEAR CHICAGO)

For Victory

Buy War Bonds and Stamps





Zemmer

Prescribe or Dispense
ZEMMER PHARMACEUTICALS
Tablets, Lozenges, Ampoules, Capsules, Ointments, etc. Guaranteed reliable potency. Our products are laboratory controlled. Write for catalogue.
Chemists to the Medical Profession

THE ZEMMER CO.
Oakland Station
Pittsburgh, Pa.
Zone 13, MIN 9-43

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.

414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.

INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS

MAIN 2494

SAVE TIME!
TRY DAHL'S FIRST

Biologicals
Pharmaceuticals
Hypodermic Medications
Dressings
Surgical Instruments
Trusses

7:30 a.m. to 11 p.m.
Holidays, 9 a.m. to 11 p.m.

Joseph E. Dahl Co.

Incorporated

ATlantic 5445 82 So. 9th St., Mpls.

Radiological and Clinical

Assistance to Physicians
in this territory

MURPHY LABORATORIES

Minneapolis: 612 Wesley Temple Bldg. - - At. 4786
St. Paul: 348 Hamm Bldg. - - - - - - - Ce. 7125
If no answer, call - - - - - - - - - - Ne. 1291



Orthopedic Braces and Appliances

Physicians' specifications followed precisely. Scientific manufacture and fitting.

AUGUST F. KROLL

Manufacturer

230 WEST KELLOGG BLVD.
St. Paul, Minn. CE. 5330

Hall & Anderson

PRESCRIPTION PHARMACY
BIOLOGICALS
PHYSICIANS' SUPPLIES

SAINT PAUL, MINN.

LOWRY MEDICAL ARTS BUILDING
TELEPHONE: CEDAR 2735

★ V ★ V ★ ★ V ★ V ★

V For a Quick Victory

Do more than your share in this month's

VICTORY BOND DRIVE

Ask us for information regarding our various

AMERICAN WAY SERVICES

THE AMERICAN NATIONAL BANK

BREMER ARCADE
7TH AT ROBERT

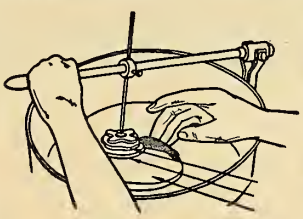
Free Parking

Member Federal Deposit Insurance Corporation

Cedar 0573

★ V ★ V ★ ★ V ★ V ★

UNUSUAL LENS GRINDING



CATARACT, MYO-THIN and other difficult and complicated lenses are ground to extreme thinness and accuracy by our expert workmen.

ARTHUR F. WILLIAMS

SAINT PAUL
MINNESOTA

Save 25 to 40 Per Cent

Druggists' Mutual Insurance Company

OF IOWA, ALGONA, IOWA

Fire - Tornado - Automobile Insurance

Prompt Loss Service

Minneapolis Branch—S. E. STRUBLE, 835 Palace Bldg.

Home Office—Algona, Iowa



Glenwood Hills Hospitals

3501 Golden Valley Road
Hyland Station
Route Seven

Operated in Connection
with
Homewood Hospital

Plymouth at Penn Avenue, Minneapolis

FOR THE TREATMENT OF NON-SURGICAL AND NON-INFECTIOUS DISEASES—A modern hospital built on the cottage plan. The buildings are located on elevated land, affording beautiful views on all sides. Glenwood Hills Hospitals have all the advantages of rural surroundings, and are still only a few minutes by automobile from the Minneapolis loop.

AN INVITATION—The facilities of these institutions are available for all reputable members of the medical profession.



HOMEWOOD HOSPITAL is one of the Northwest's outstanding hospitals for the treatment of Nervous Disorders—equipped with all the essentials for rendering high grade service to patient and physician.

Operated in Connection with Glenwood Hills Hospitals

HOMEWOOD HOSPITAL

Corner Penn and Plymouth Avenues North
Minneapolis Minnesota

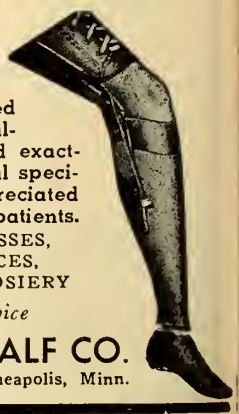
Send us your slow collection items.
All accounts made by personal calls.
We specialize in Medical and Dental Accounts.

Bonded and Licensed Under Minnesota State Laws

Northwestern Adjustment Co.

518 Bremer Arcade Bldg.
St. Paul Minnesota

RELIABILITY!



For years we have maintained the highest standards of quality, expert workmanship and exacting conformity to professional specifications . . . a service appreciated by physicians and their patients.

ARTIFICIAL LIMBS, TRUSSES, ORTHOPEDIC APPLIANCES, SUPPORTERS, ELASTIC HOSIERY

Prompt, painstaking service

BUCHSTEIN-MEDCALF CO.

610 3rd Ave. South Minneapolis, Minn.

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 **October, 1943** **No. 10**

Contents

Recent Advances in Our Knowledge of Coronary Sclerosis and Its Bearing on the Clinical Management of Patients.
Arlie R. Barnes, M.D., Rochester, Minnesota..... 863

The Hypertension Heart.
George Fahr, M.D., Minneapolis, Minnesota..... 867

Psychosomatic Aspects of Hypertension.
William H. Hengstler, M.D., Saint Paul, Minnesota 870

Medical Management of Early Cases of Hypertension.
Simon G. Sax, M.D., Duluth, Minnesota..... 874

General Care of the Aged.
J. F. Norman, M.D., Crookston, Minnesota..... 876

Nutritional Management of the Aged.
Edward L. Tuohy, M.D., F.A.C.P., Duluth, Minnesota 881

Surgical Treatment of the Aged.
O. Theron Clagett, M.D., Rochester, Minnesota... 884

Studies of the Diagnosis and Treatment of Epidemic and Experimental Poliomyelitis with Poliomyelitis Anti-Streptococcic Serum: Summary of Results.
Edward C. Rosenow, M.D., Rochester, Minnesota 890

Clinical Pathological Conference:
Presentation of a Case.
A. J. Hertzog, M.D., and *S. V. Lofsness, M.D.,* Minneapolis, Minnesota 896

Case Report:
Agranulocytosis Associated with Sulfadiazine Therapy.
Edmund B. Flink, M.D., and *Theodor E. Bratrud, M.D.,* Minneapolis, Minnesota..... 898

History of Medicine in Minnesota:
History of Medicine in Dodge County. (*Continued*)
James Eckman, Rochester, Minnesota, and *Charles E. Bigelow, M.D.,* Dodge Center, Minnesota 900

President's Letter 906

Editorial:
The A.H.A. and the A.M.A..... 907
Sudden Death from Coronary Occlusion..... 908
Muscle Co-ordination and Endurance..... 908
Fingerprinting of Medical Students and Physicians 909
Poliomyelitis and Epidemic Meningitis..... 909
Health and Accident Insurance Policies..... 910

Medical Economics:
Responsibility in Terminal Illness of Recipients of OAA 911
Corporation Practice Illegal in Minnesota..... 912
Minnesota State Board of Medical Examiners... 913
Licentiates for March, April and June..... 913

Minnesota State Medical Association:
Proceedings, Ninetieth Annual Session (*Concluded*) 916

Reports and Announcements..... 929

In Memoriam 931

Of General Interest..... 932

Contents of Minnesota Medicine copyrighted by Minnesota State Medical Association, 1943

Entered at the Post Office in Minneapolis as second class mail matter. Accepted for mailing at the special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 13, 1918.

MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL ASSOCIATION

Published by the Association under the direction of its Editing and Publishing Committee

EDITING AND PUBLISHING COMMITTEE

E. M. HAMMES, Saint Paul
PHILIP F. DONOHUE, Saint Paul
H. W. MEYERDING, Rochester
H. A. ROUST, Montevideo
B. O. MORK, JR., Worthington
A. H. WELLS, Duluth
O. W. ROWE, Duluth
T. A. PEPPARD, Minneapolis
HENRY L. ULRICH, Minneapolis
C. L. OPPEGAARD, Crookston

EDITORIAL STAFF

CARL B. DRAKE, Saint Paul, Editor
GEORGE EARL, Saint Paul, Associate Editor
HENRY L. ULRICH, Minneapolis, Associate Editor

BUSINESS MANAGER

J. R. BRUCE

Annual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian Subscriptions—$3.50.

The right is reserved to reject material submitted for editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

Classified advertising—five cents a word; minimum charge, $1.00. Remittance should accompany order.

Display advertising rates on request.

Address all communications to Minnesota Medicine, 2642 University Avenue, Saint Paul, or National Bldg., Minneapolis. Telephone Nestor 2641.

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN



MAIN BUILDING—ONE OF THE 5 UNITS IN "COTTAGE PLAN"

A Modern Private Sanitarium for the Diagnosis, Care and Treatment of Nervous, Mental and Medical Cases

Located on beautiful Lake St. Croix, eighteen miles from the Twin Cities, it has the advantages of both City and County. Every facility for treatment provided, including recreational activities and occupational therapy under trained personnel. Milk, cream and butter from our own herd of Tuberculin-tested Registered Guernsey Cows. Inspection and coöperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

CONSULTING NEURO-PSYCHIATRISTS

RESIDENT PHYSICIAN
Howard J. Laney, M.D.
Prescott, Wisconsin
Tel. 39

Hewitt B. Hannah, M.D.
Joel C. Hultkrans, M.D.
511 Medical Arts Building
Minneapolis, Minnesota
Tel. MAin 4672

SUPERINTENDENT
Ella M. Mackie
Prescott, Wisconsin
Tel. 69

Triumphs in Triage*

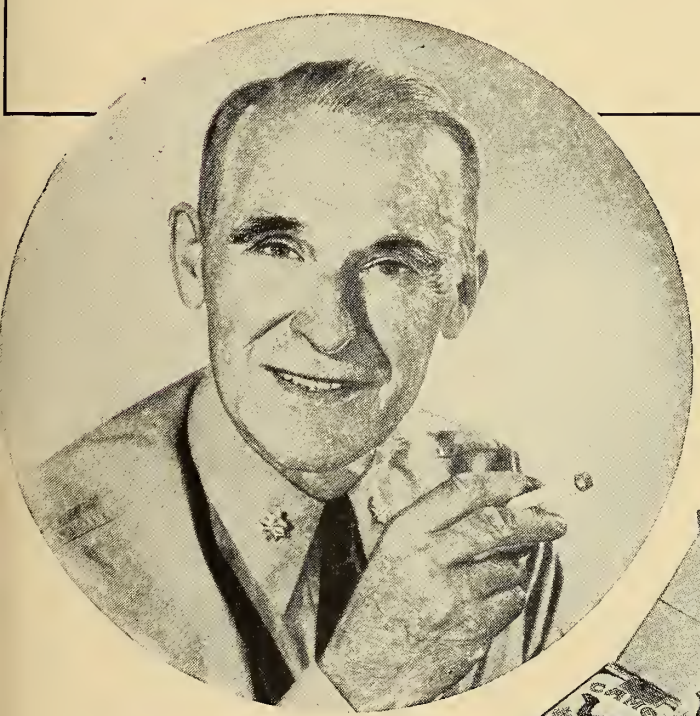


*MEDICAL triage in war—front-line classification of casualties—is among the toughest assignments of the military physician. Instant diagnosis—often under direct fire—countless variations—new, baffling situations.

Seldom cited, rarely in print, the military doctor has little leisure time. When he does get around to relaxing, you're apt to find him taking his ease with a cheering cigarette.

. . .

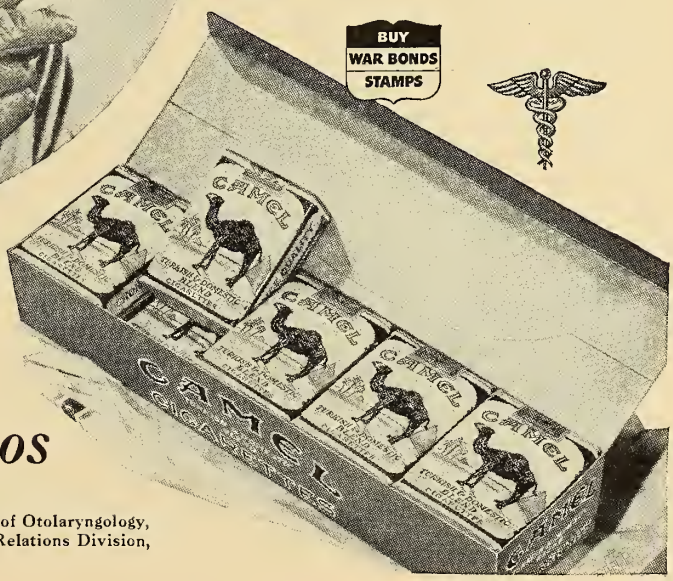
Thinking of gifts to those in service? Send Camels . . . the gift that's *appreciated!* It's the favorite brand of the armed forces† for the kind of smoking fighting men deserve.



1st in the Service

† With men in the Army, Navy, Marine Corps, and Coast Guard, the favorite cigarette is Camel. (Based on actual sales records.)

BUY WAR BONDS STAMPS



Camel

—costlier tobaccos

New reprint available on cigarette research — Archives of Otolaryngology, March, 1943, pp. 404-410. Camel Cigarettes, Medical Relations Division, 1 Pershing Square, New York 17, N. Y.

Remember in 1932 we brought out Pablum? A new concept of cereal nutrition, easy of preparation, non-wasteful, fore-runner of present-day widely practised principles of food fortification—remember?



Now we have gone a step further in Pabena, similar in nutritional and convenient features to its father-product, Pablum, different in flavor because of its oatmeal base. If our pioneer work and ethical conduct meet with your approbation, remember, please, to specify Pablum and Pabena.

Mead Johnson & Company, Evansville, Indiana, U.S.A.

"Till He Comes Marching Home"





THE lonely lad sleeping in a foxhole remembers Mother as she was when he choked back the lump in his throat to kiss her goodbye for the last time. He does not realize that she may change, physically and psychically. To him she remains the same . . . always.

When he returns a great part of his dream can come true because THEELIN, an estrogen with a brilliant record of effectiveness, gives to many mothers in the climacterium continued relief from menopausal symptoms often intensified by the stress and worry of wartime living. Psychotic manifestations and somatic disturbances associated with ovarian hypofunction usually respond to the governing influence of this pure, crystalline estrogenic substance obtained from pregnancy urine. Its record of therapeutic usefulness and comparative freedom from undesirable side reactions has been proved by millions of doses and hundreds of published papers.

For sustained therapy between injections and for controlling milder menopausal symptoms THEELOL Kapseals* and THEELIN Suppositories are supplied. The latter may also be used in gonorrheal vaginitis in children.

Supplied as: THEELIN AMPOULES—in 1000, 2000, 5000 and 10,000 I. U. in oil, or in 20,000 I. U. in aqueous suspension • THEELOL KAPSEALS—in .12 and .24 mg. of Theelol • THEELIN SUPPOSITORIES—in 2000 I. U. of Theelin.

*Trade-Mark Reg. U. S. Pat. Off.

THEELIN

A product of modern research offered to the medical profession by

ARMY E NAVY

PARKE, DAVIS & COMPANY

DETROIT, MICHIGAN

"SYMBOL OF QUALITY
IN THE FIELD OF
NUTRITION"



INFANT NUTRITION

• BIOCHEMICALS FOR
DEFICIENCY DISEASES

S. M. A. CORPORATION • 8100 McCORMICK BLVD • CHICAGO, ILL.

Now Available

FOR ORAL USE

There has long been a real need for a potent, mercurial diuretic compound which would be effective by mouth. Such a preparation serves not only as an adjunct to parenteral therapy but is very useful when injections can not be given.

After the oral administration of Salyrgan-Theophylline tablets a satisfactory diuretic response is obtained in a high percentage of cases. However, the results after intravenous or intramuscular injection of Salyrgan-Theophylline solution are more consistent.

Salyrgan-Theophylline is supplied in two forms:

Tablets (enteric coated) in bottles of 25, 100 and 500. Each tablet contains 0.08 Gm. Salyrgan and 0.04 Gm. theophylline.

Solution in ampuls of 1 cc., boxes of 5, 25 and 100; ampuls of 2 cc., boxes of 10, 25 and 100.

Write for literature

ACCEPTED AMERICAN MEDICAL ASSN. Council on Pharmacy and Chemistry

SALYRGAN-THEOPHYLLINE

"Salyrgan," trademark Reg. U. S. Pat. Off. & Canada

Brand of MERSALYL with THEOPHYLLINE

ARMY E NAVY

WINTHROP CHEMICAL COMPANY, INC.

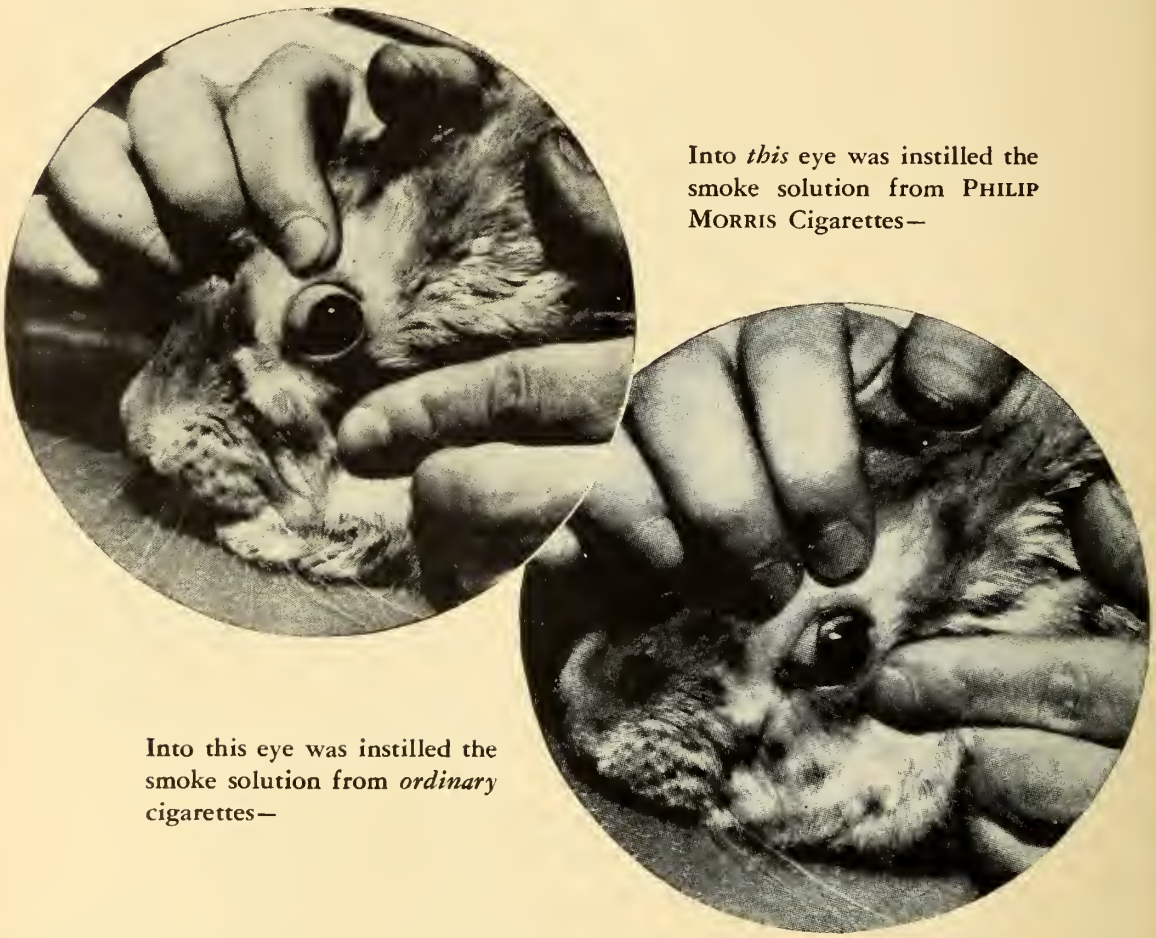
Pharmaceuticals of merit for the physician

NEW YORK 13, N. Y. WINDSOR, ONT.

WINTHROP

CIGARETTE DIFFERENCES

as shown by the rabbit-eye test



Into *this* eye was instilled the smoke solution from PHILIP MORRIS Cigarettes—

Into this eye was instilled the smoke solution from *ordinary* cigarettes—

NOTE THE DIFFERENCE in Edema. Average produced by *ordinary* cigarettes: 2.7. Average produced by PHILIP MORRIS: 0.8. CLINICAL TESTS showed that when *smokers* with irritation of the nose and throat due to smoking changed to PHILIP MORRIS, every case of irritation cleared completely or definitely improved.

From tests published in Proc. Soc. Exp. Bio. and Med., 1934, 32, 241-245; Laryngoscope, 1935, XLV, No. 2, 149-154

Winter's attacking armies fear—

SULFADIAZINE

Lederle

WINTER INFECTIONS encircle and drag down the unwary when snow and blustering winds lower resistance. Many of these infections may be arrested or cured by sulfadiazine. Infections most likely to respond to such therapy include those caused by

- PNEUMOCOCCI
- HEMOLYTIC STREPTOCOCCI
- STAPHYLOCOCCI
- MENINGOCOCCI
- FRIEDLÄNDER'S BACILLUS "B"
- H. INFLUENZAE
- E. COLI
- A. AEROGENES
- SHIGELLA DISPAR





Publications by the score attest the clinical value of this "Drug of the Year" for these infections.

Literature on request.

PACKAGES:

SULFADIAZINE TABLETS FOR ORAL USE
Bottles of 50, 100, 1,000, 5,000 and 10,000 tablets 0.5 Gm. (7.7 grains) each.

SODIUM SULFADIAZINE SOLUTION PARENTERAL 25%
Sets of 6, 25 and 100 ampuls (10 cc. each).

LEDERLE LABORATORIES A UNIT OF AMERICAN CYANAMID COMPANY **INC.**

30 ROCKEFELLER PLAZA, NEW YORK 20 NEW YORK



NOT HOW FAST ...*but,* HOW LONG

THE CHOICE of a sedative for the sleepless patient is not alone dependent upon the rapidity of its action, but also upon the duration of action and how the patient feels when he awakens.

Ipral Calcium—a moderately long-acting barbiturate—induces a sound restful sleep closely resembling the normal. One or two tablets, administered orally approximately one hour before sleep is desired, provides a six- to eight-hour sleep from which the patient awakens generally calm and refreshed.

Ipral Calcium is a plain white tablet—and one not easily identified by the patient. It is readily absorbed and rapidly eliminated and undesirable cumulative effects may be avoided by proper regulation of dosage.

HOW SUPPLIED

Ipral Calcium (calcium ethylisopropylbarbiturate) in 2-grain tablets and in powder form for use as a sedative and hypnotic. ¾-grain tablets for mild sedative effect throughout the day.

Ipral Sodium (sodium ethylisopropylbarbiturate) in 4-grain tablets for pre-anesthetic medication.

Elixir Ipral Sodium in pint bottles.

For literature address the Professional Service Dept., 745 Fifth Avenue, New York 22, N. Y.

E·R·SQUIBB & SONS, NEW YORK
MANUFACTURING CHEMISTS TO THE MEDICAL PROFESSION SINCE 1858



Some overworked doctor may appreciate knowing that . . .

Biolac saves time

Biolac provides for all nutritional needs of the young infant except vitamin C. You save valuable time because there are no extra formula ingredients to be calculated.

Biolac assures formula safety

Since mothers simply dilute Biolac with boiled water as you prescribe, there is less chance of upsets arising from errors or contamination in preparing formulas.

NO LACK IN BIOLAC

Borden's complete infant formula

● *Biolac is prepared from whole milk, skim milk, lactose, Vitamin B_1, concentrate of Vitamins A and D from cod liver oil, and ferric citrate. It is evaporated, homogenized, and* sterilized. *For professional information, write Borden's Prescription Products Division, 350 Madison Avenue, New York City.*

PYOKTANIN SURGICAL GUT

Plain and Formalized

Manufactured Since 1899 by

The Laboratory of the Ramsey County Medical Society

Packaged dry in hermetically sealed glass tubes in accordance with the new requirements of the U. S. Pharmacopœia.

• • •

Price List

PLAIN TYPE A NONBOILABLE
AND
FORMALIZED TYPE C NONBOILABLE

Sizes.....000 — 00 — 0 — 1 — 2 — 3
28 inches.....per dozen strands $2.00
60 inches.....per dozen strands $3.00

Special discount to hospitals and to the trade. Cash must accompany the order.

• • •

Address

LABORATORY RAMSEY COUNTY MEDICAL SOCIETY

Lowry Medical Arts Building, St. Paul, Minnesota

FOR SALE BY SURGICAL DEALERS AND DRUGGISTS



ADRENAL CORTEX EXTRACT (UPJOHN) is distinctive in its therapeutic action in that it affords the multiple actions of the many active principles of the adrenal cortex. This makes possible more effective, potent therapy for increasing muscle tone and capacity for work, for improving resistance, and for alleviating apathy and depression in adrenal cortical insufficiency.

There is no one synthetic duplicate which can influence carbohydrate metabolism, capillary tone, vascular permeability, plasma volume, body fluids and electrolytes.

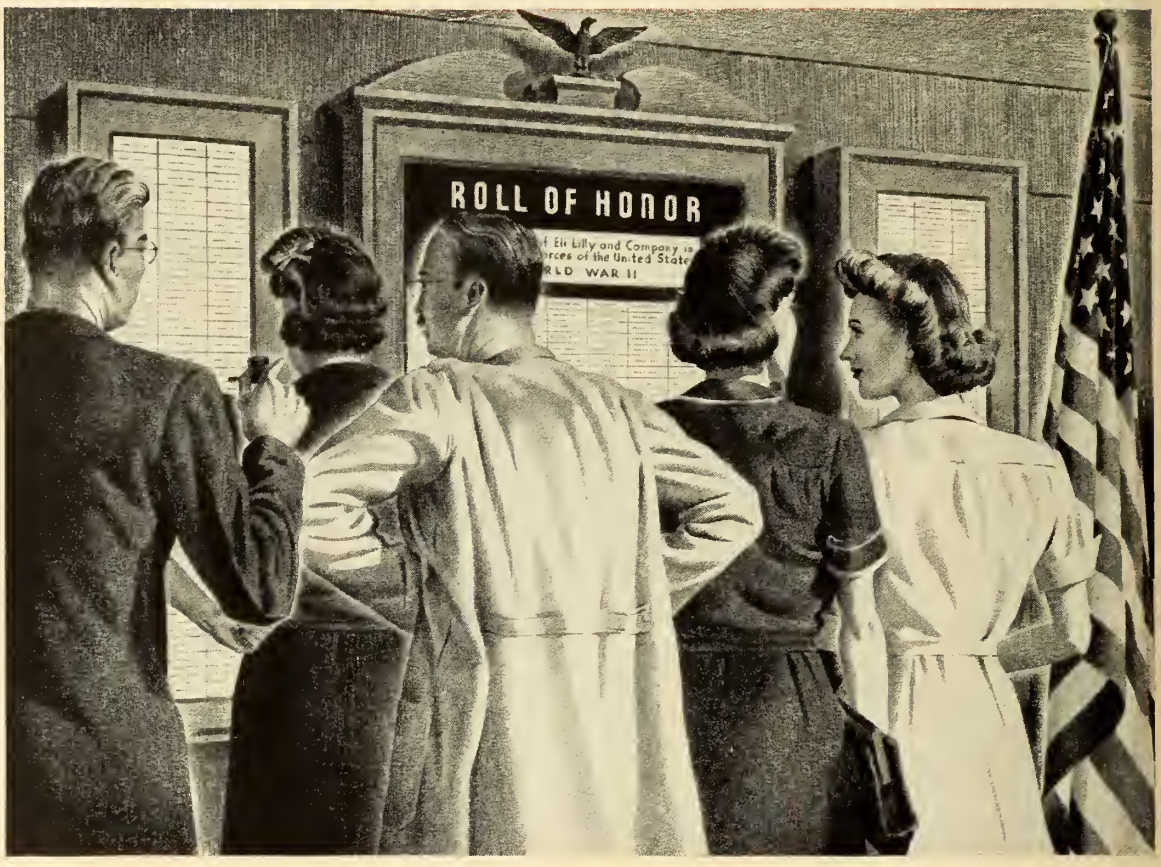
ADRENAL CORTEX EXTRACT (UPJOHN) can be given intravenously, as well as by subcutaneous and intramuscular injection. Whenever potent replacement therapy is indicated—

Adrenal Cortex Extract (Upjohn)

Sterile Solution in 10 cc. rubber-capped vials for subcutaneous, intramuscular and intravenous therapy

Upjohn
KALAMAZOO, MICHIGAN

Honor Roll



WAR DIPS DEEPLY into the world-wide family of Lilly men and women. Hundreds of them are faithfully serving in the armed forces of the allied nations. Those at home do their part, too, for essential drugs must be supplied in ever-increasing quantities for military and civilian use. Eli Lilly and Company honors those associates under arms and salutes those who carry on Lilly traditions of integrity in the manufacture of finest pharmaceuticals, be it in war or in peace.

Lilly

BUY WAR BONDS AND STAMPS

ELI LILLY AND COMPANY

INDIANAPOLIS 6, INDIANA, U.S.A.

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 October, 1943 No. 10

RECENT ADVANCES IN OUR KNOWLEDGE OF CORONARY SCLEROSIS AND ITS BEARING ON THE CLINICAL MANAGEMENT OF PATIENTS

ARLIE R. BARNES, M.D.

Rochester, Minnesota

FROM time to time we need to take account of the information derived from research and clinical studies of disease of the coronary arteries and to see what bearing the facts unearthed have on our medical management of this condition.

The most important contribution to our knowledge of coronary disease in recent years is the revelation of the kind and degree of adjustments that take place in the coronary circulation following atresia or closure of coronary vessels. For a long time the teaching of Cohnheim and von Schulthess-Rechberg and of Spalteholz that the coronary arteries were end arteries was accepted. But it is the present consensus that an anastomotic circulation exists in the normal heart. Wiggers stated that this circulation is not effective under ordinary conditions but that it is made effective whenever a pressure gradient is produced by serious interference with the circulation in other branches of the coronary arteries. Blumgart, Schlesinger and Davis in a series of brilliant injection studies of hearts affected by coronary disease have shown conclusively that an effective anastomotic circulation develops whenever need for it occurs as a result of partial or complete closure of a coronary vessel and that this circulatory adjustment is localized to the area where it is needed (Fig. 1). In the light of this knowledge the survival of the patient following acute or chronic coronary occlusion will depend upon the speed with which this anastomotic circulation develops and upon its efficiency.

This leads us to a consideration of the factors which possibly may condition the anastomotic coronary circulation for quick and efficient function. Many years ago Oberhelman and LeCount studied this problem and concluded that the gradual development of coronary sclerosis constituted the chief impetus to the development of an anastomotic circulation. They felt that a gradually developing coronary sclerosis furnished the best guarantee that an efficient anastomotic circulation would be provided to enable a patient to survive a subsequent attack of coronary occlusion and there is much to recommend their point of view.

They found, moreover, that some hearts without disease of the coronary arteries possessed a functioning anastomotic circulation. In that sense some individuals inherently are better endowed than others to withstand coronary occlusion. Schlesinger denied that effective collateral coronary circulation existed in normal hearts. On the contrary, Smith, using an injection technic similar to that of Schlesinger, demonstrated an effective collateral circulation in 60 per cent of normal hearts (Fig. 2).

Several investigators have concluded that the efficiency of a collateral coronary circulation increases with advancing age in normal hearts. Schlesinger and Smith did not find that to be true. Smith demonstrated such anastomoses in the youngest heart in the group, that of a boy seven-

From the Division of Medicine, the Mayo Clinic, Rochester, Minnesota. Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, May 18, 1943.

teen years of age, and failed to find them in the oldest heart injected, that of a man eighty-one years of age.

Another important viewpoint emerges from these investigations, namely, that the coronary circulation must be considered as a unit. It will not suffice to assess the degree of damage from coronary sclerosis on the basis of the amount of coronary sclerosis present in a single branch of the coronary vessels. Rather it is necessary to determine the degree of coronary sclerosis or closure in all the main branches and estimate the gravity of the damage to the coronary circulation on the basis of the average of the amount of coronary disease present in all these vessels.

The amount of functional impairment of the heart imposed by degrees of coronary sclerosis is conditioned greatly by the load the heart carries and the hypertrophy produced by other cardiac pathologic conditions. Such conditions include hypertension, valvular heart disease and chronic cor pulmonale among others. Thus the coronary circulation may be seriously inadequate if moderate coronary sclerosis coexists with severe hypertension and marked cardiac hypertrophy, whereas much greater disease of the coronary arteries may be well tolerated when the heart is normal in size and not subjected to any other additional burdens imposed by hypertension or other cardiac disease.

The purpose of a review of all these factors is to obtain a more rational basis for the management of patients who have suffered attacks of acute coronary occlusion and acute myocardial infarction. We are fairly well agreed on a period of rest in bed of some five to six weeks

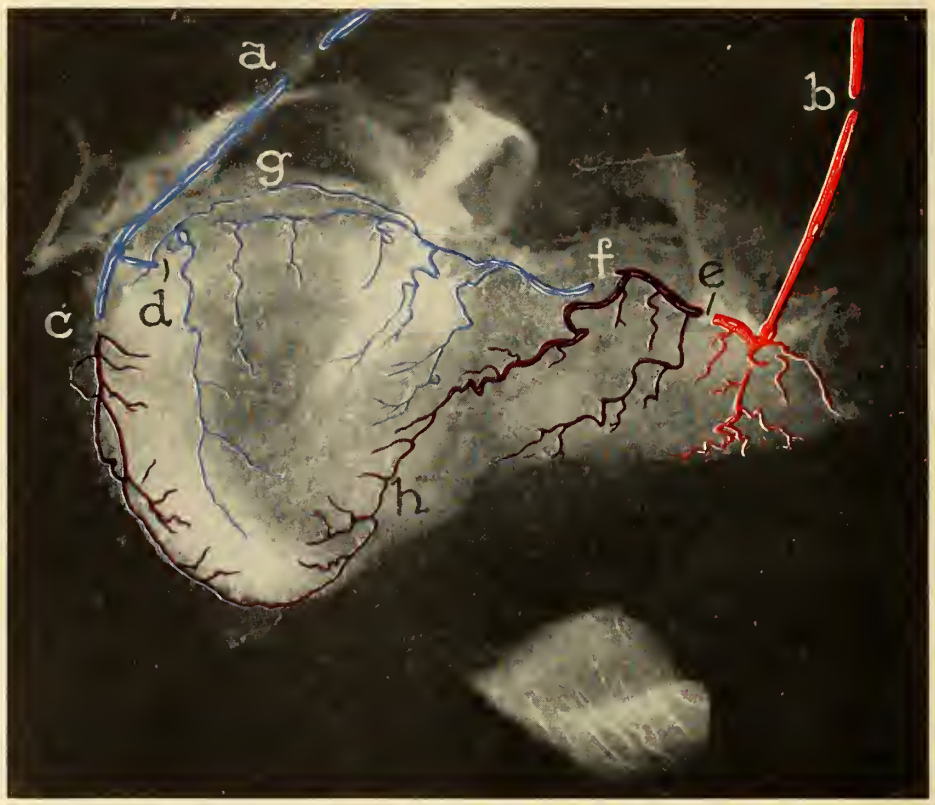


Fig. 1. Reproduced from Smith's thesis. Coronary vessels injected according to the technic of Schlesinger.

a. Canulla in left coronary artery.
b. Cannula in right coronary artery.
c. Arteriosclerotic occlusion in anterior descending branch.
d. Occlusion of left circumflex artery by an organized thrombus.
e. Arteriosclerotic occlusion in right coronary artery.
f. Occlusion of circumflex branch of right coronary artery by an organized thrombus. [Note: This branch is entirely filled from the injection in the left coronary artery.]
g. Arteria auricularis anastomotica magna.
h. Anastomosis between anterior descending branch of the left coronary and a descending branch of the right coronary artery. [Note: The branches injected by a purple medium represent admixture of injection mediums from both the left and the right coronary artery.]

following acute coronary occlusion. But it is in our subsequent management of these patients that our practice varies widely. It seems to me that we should bear in mind that our chief hope in their subsequent management is to provide adequate time and conditions for collateral circulation to develop and we have very good reason to believe that this requires many months for its accomplishment. If we subscribe to that point of view, we will not allow these patients to resume work for months and in some instances for from one to two years. We may allow them to be up eight to ten hours daily and they may be permitted to walk in moderation if it does not result in any distress. They should be forbidden to resume business responsibilities, except in the most minor degrees, in that time. It seems to me we should view their convalescence much as we regard the after-care of a patient whom we discover to have pulmonary tuberculosis. We do not hesitate to impose the strictest limitation on the latter patients for periods of from six months to two years and to modify their way of life for an indefinite period thereafter.

The studies of Blumgart, Schlesinger and Davis have taught us that angina pectoris without a history of acute coronary occlusion is associated with chronic and presumably slow closure of one or more branches of the coronary arteries more commonly than we had supposed. Closure of one or more branches is likely to be indicated when mild symptoms of angina pectoris suddenly become more severe or frequent, when angina pectoris decubitus appears and when the anginal syndrome suddenly reappears after a patient has been free from pain for a considerable period after acute coronary occlusion. These patients demand especial care in their management and should be put to bed for rest periods not dissimilar to that advised for a patient who has had an attack of acute coronary occlusion. The intensification of their anginal syndrome simply means that the collateral circulation is not keeping pace with the advance in the average total degree of coronary sclerosis.

Some useful lessons may be inferred from the relation of electrocardiographic changes to coronary sclerosis. Generally speaking, the electrocardiogram will show significant changes in acute coronary occlusion if it results in acute myocardial infarction. In a very large number of cases in which acute myocardial infarction has not occurred the electrocardiogram is normal when coronary sclerosis and angina pectoris are present unless the tracing is taken during an attack



Fig. 2. Reproduced from Smith's thesis. Coronary artery injected according to the technic of Schlesinger. Normal heart injected through the right coronary artery alone.

a. Cannula in right coronary artery.

b. Left coronary artery. [Note: The left coronary artery is fully injected although the injection was carried out only through the right coronary artery.]

of angina pectoris or during anoxia induced by having the patient breathe 10 per cent oxygen for a period of fifteen to twenty minutes. Since these electrocardiographic changes may be obtained only under these circumstances (Fig. 3), it may be inferred that temporary and severe impairment of cardiac function occurs from anoxia of the heart muscle during an attack of angina pectoris. If we recall that many patients suffering from angina pectoris have had chronic closure of one or more coronary branches and that under these circumstances, chronic or perhaps minute acute insular infarction is occurring as revealed at necropsy, we shall not look upon attacks of angina pectoris too lightly. We shall be deeply concerned that the patient modify the circumstances which produce angina pectoris to a point where the attacks are not produced, prescribing rest in bed for considerable periods when this result cannot be accomplished otherwise. More frequent and prompt resort to glyceryl trinitrate to cut short the attack of pain seems indicated by this conception of the disease.

Finally, there is one aspect of the program of restriction to be imposed on patients suffering from acute coronary occlusion or on those in

whom we suspect the development of chronic coronary occlusion that has not received sufficient attention. Whatever the relation of coronary sclerosis and stress of living may be, the fact remains that coronary occlusion and advanced coronary sclerosis occur frequently in those who have driven themselves to the breaking point. Very frequently these patients are grievously tired. A prolonged period of rest restores shattered nerves and enables the patient to relax as he has not done in years. He begins to look at himself without emotion and to see the enormity of his past mistakes. He then resolves that upon resumption of activity he will adhere to a sensible program of living. The grayish pallor which often characterizes his facies in the early stages of his illness may give way to a more healthy pink. Such a patient evolves a philosophy of contentment with a lower level of activity which is the best portent that he will survive and enjoy a considerable period of future usefulness.

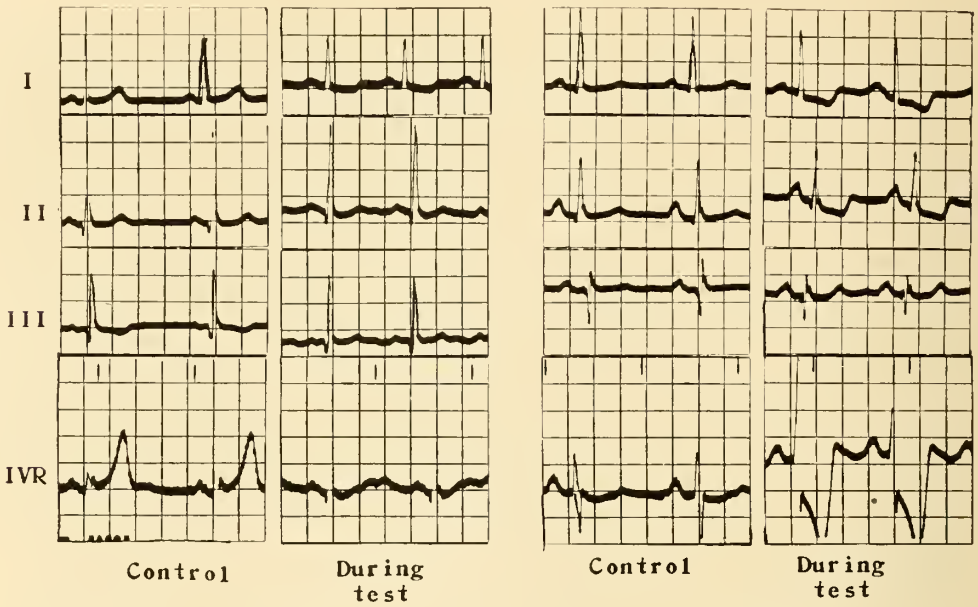


Fig. 3. Electrocardiograms obtained on two patients. In each case a control electrocardiogram is obtained before the test is taken. Electrocardiograms are then obtained when the patients have breathed a mixture of air containing 10 per cent oxygen for a period of twenty minutes.

References

1. Blumgart, H. L., Schlesinger, M. J., and Davis, David: Studies on the relation of the clinical manifestations of angina pectoris, coronary thrombosis and myocardial infarction to the pathologic findings; with particular reference to the significance of the collateral circulation. Am. Heart J., 19:1-91, (Jan.) 1940.
2. Cohnheim, J., and von Schulthess-Rechberg, A.: Ueber die Folgen der Kranzarterienverschleissung für das Herz. Virchows Arch. f. path. Anat., 85:503-537, (Sept.) 1881.
3. Oberhelman, H. A., and LeCount, E. R.: Variations in the anastomosis of the coronary arteries and their sequences. J.A.M.A., 82:1321-1325, (Apr. 26) 1924.
4. Schlesinger, M. J.: Injection plus dissection study of coronary artery occlusions and anastomoses. Am. Heart J., 15:528-568, (May) 1938.
5. Smith, R. L.: An injection study of intercoronary anastomoses in the human heart. Thesis, Graduate School of the University of Minnesota, 1941.
6. Spalteholz, Werner: Die Arterien der Herzwand; anatomische Untersuchungen an Menschen und Tierherzen. Leipzig: S. Hirzel, 1924.
7. Wiggers, C. J.: The inadequacy of the normal collateral coronary circulation and the dynamic factors concerned in its development during slow coronary occlusions. Am. Heart J., 11:641-647, (June) 1936.

2,000,000 EXTRA BABIES BORN WITHIN TEN YEARS

A dividend for the United States of 2,000,000 babies in ten years is announced by statisticians of the Metropolitan Life Insurance Company in New York. In other words, by the end of 1943 according to their calculations, close to 2,000,000 more babies will have been born in this nation since 1933 than would have been born if the 1933 birth rate had prevailed.

The nation's birth rate, they point out, yielded this extra "without the propaganda and pressure which have characterized the intensive campaigns of the Axis countries for more babies.

"The greater fertility," they conclude, "has been the voluntary expression of a free people who have faith in the future of their country."—*Science News Letter,* September 25, 1943.

THE HYPERTENSION HEART

GEORGE FAHR, M.D.

Minneapolis, Minn.

SIXTEEN years ago I addressed the Duluth meeting of the Minnesota State Medical Society on the subject of the heart in hypertension.[2] At that time I calculated that somewhere in the neighborhood of 140,000 persons with hypertension died in the United States every year, of whom 70,000 died of heart failure or coronary thrombosis. These figures have been accepted by most writers on hypertension. In the intervening sixteen years I have had ample opportunity for increasing my studies on the hypertension heart. With this added knowledge, I have very little to add to the material in that early paper. My experience at the autopsy table has, in the meantime, also become very much greater and I am now inclined to emphasize even more than at that time that coronary arteriosclerosis is a very important factor in causing the death of these patients.

I would now state that patients with high degrees of hypertension may carry on without any symptoms of congestive heart failure from fifteen to twenty years, if there is very little or no coronary arteriosclerosis associated with the hypertension. If there is a moderate or severe degree of coronary arteriosclerosis present, congestive heart failure or coronary thrombosis may cut down this expectancy materially. As you well know, patients with aortic stenosis and aortic insufficiency can very often carry out their daily occupations for many years before signs of congestive heart failure develop. In both valve defects we have the same kind of strain imposed upon the left ventricle. Moreover, in both of these conditions there is a very definite decrease in flow of blood through those coronary arteries which are supplying the blood to the left ventricle which has the brunt of the increased cardiac work to carry.[6] This is not the case in hypertension because, as the blood pressure rises and the work of the left ventricle increases, there is an increased flow of blood through the coronary arteries supplying the left ventricle which corresponds roughly to the rise in the mean blood pressure.[7] In severe aortic stenosis, although the work of the left ventricle is increased undoubtedly even more than in severe hypertension, the flow of blood through the coronary arteries supplying the left ventricle is decreased and the same is true to a lesser extent in aortic insufficiency. Therefore, everything else being equal, the tendency to failure of the left ventricle is greater in aortic stenosis and in aortic insufficiency than in hypertension. It is only when the coronary arteries are narrowed by an accompanying coronary arteriosclerosis and the blood supply to the left ventricle thereby reduced that the rate of development of the tendency to heart failure will be the same in a case of high blood pressure as in a case of aortic stenosis and aortic insufficiency.

Hypertension accelerates the speed with which arteriosclerosis develops in the coronary arteries so that the majority of individuals with hypertension who die of heart failure show moderate to severe degrees of coronary arteriosclerosis. At autopsy we have frequently observed individuals with very little coronary arteriosclerosis who have lived fifteen or more years with their high blood pressure; a few have lived over twenty years and an occasional one has lived twenty-five years. But when coronary disease develops to the point that the flow of blood to the left ventricle is decreased, then the rate at which heart failure symptoms develop is much more rapid. As you all very well know, there are many individuals with coronary arteriosclerosis who have never had any hypertension or have only had a very mild degree of hypertension who, nevertheless, die of congestive heart failure. As Dr. Barnes is going to take up the subject of coronary arteriosclerosis, I am going to avoid a discussion of it as much as possible but I want to emphasize that it is a major factor in the development of congestive heart failure as well as coronary thrombosis when hypertension is present.

There is no question that the combination of hypertension with an occupation entailing severe physical exertion will bring about heart failure sooner than where the factor of physical exertion

From the Department of Medicine at the Minneapolis General Hospital and the University of Minnesota, Minneapolis, Minnesota.

Abstract of address at the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, May 18, 1943.

is less. Yet I have been surprisd to see how long patients with occupations entailing considerable physical exertion will carry on with high blood pressure for long periods of time before congestive heart failure develops when the coronaries are very little narrowed through the process of coronary arteriosclerosis.

In my earlier teaching of the characteristic signs of the heart in hypertension, I emphasized the boot-shaped heart as being characteristic of this diease, pointing out at the same time that it was also characteristic of the heart in aortic disease. I now want to add a word of caution to the boot-shaped heart as being diagnostic of hypertension when aortic disease is ruled out. Many people who have no hypertension or very mild degrees of it will show the boot-shaped heart on x-ray or percussion examination and the autopsy will show that they have coronary arteriosclerosis only. I have followed individuals for a number of years and they have been well examined for blood pressure previous to this period and some have never shown any hypertension and others only very slight degrees of hypertension. Then when the autopsy is performed, they will be found to have coronary arteriosclerosis and hypertrophied left ventricles. A decreased oxygen supply to heart muscle causes dilatation of the heart.[5] But dilatation causes an increased oxygen consumption and increased combustion of energy yielding materials in this muscle, just as increased work does.[1,4,8] This increased oxygen consumption and increased oxidation of energy-yielding substances in the heart muscle is the most probable cause of hypertrophy. It has been customary for the x-ray man to make diagnoses of hypertension from the boot-shaped heart and I now want to warn against it just as I want to warn you from accepting increased weight of the heart without other evidence of hypertension as being unequivocal evidence of previous hypertension.

I would like to warn against accepting a systolic murmur at the apex in hypertension as being diagnostic of leakage of the heart, in the sense of an organic lesion of the valve. I find this mistake still being made. It is true there may be a relative leakage of the mitral associated with a dilatation of the left ventricle but this is not what we usually mean by the term "leakage of the heart." When we use the term leakage of the heart, we mean organic mitral or organic aortic disease and I think we should use this term accurately.

I would like to point out that the blood pressure, especially the diastolic blood pressure, often remains high even in severe failure until towards the end but that the onset of severe coronary arteriosclerosis or a coronary thrombosis may result in a drop in the diastolic blood pressure where hypertension has been previously present.

As to the treatment of the heart in hypertension, it differs not at all from the treatment of congestive heart failure produced by organic disease of the valves. In the early stages reduction in the amount of physical exertion is, of course, to be advised. When frank heart failure is present, strict bed rest must be ordered. I am now inclined to put them all on low salt diets as soon as there is clinical evidence that heart failure has started. They may not have developed any edema but there is some evidence that increased salt intake tends in itself to aid in the production of heart failure in hearts which have been decompensated or are about to decompensate. It isn't at all difficult to get the daily intake of salt down around 2.5 grams by allowing no salt to be added to the food by the cook and adding no salt at the table. Salt-free butter can be obtained in most cities and in the country one can wash out the salt. Salt-free bread is hard to obtain but the patient can be admonished to use very little bread. Whereas the cereal foods contain wonderful stores of some of the essential vitamins, white flour when unfortified contains practically none and even when fortified is not yet complete protection against low vitamin content. Since lack of vitamin B_1 is another cause of heart failure, reducing the consumption of unfortified white bread is in itself a salutary measure in heart failure. If the salt intake is low, there will be very little tendency to edema formation, even with a daily intake of 1500 c.c. of fluid and the low salt intake apparently will help to put off somewhat farther the onset of clinical failure. Wherever there is congestive heart failure, digitalis will increase the mechanical efficiency of the heart and in doing so will reduce the venous pressure in the pulmonary veins and the systemic veins and with that reduction, dyspnea and edema will usually disappear. Of course there is an end to all things and the time will arrive when digitalis will not restore the mechanical efficiency of the heart to a point at which clinical symptoms of heart failure will disappear, but one can frequently keep a heart going mod-

erately well through the use of digitalis for a number of years.

Digitalis in approximately one Hatcher Brody cat unit per day for the 150-pound patient can be given every day, year in and year out, for many years without producing anything harmful to the patient's heart or any other organ. Of course there are patients who have idiosyncrasies and cannot take full doses of digitalis but they are few in number. Before a heart starts to dilate, I am inclined to believe that digitalis should not be given but recent researches done by Dr. Erickson and myself have shown that digitalis will increase the mechanical efficiency of the heart even if clinical symptoms are absent when the heart has dilated and it is therefore indicated as soon as diltatation is definitely made out. There is nothing to fear from digitalis in so far as raising the blood pressure is concerned. If digitalis raises the blood pressure it raises it only because it increases the output of a failing heart. At the same time that it increases the work of the heart, it increases the mechanical efficiency of the heart so that the increased amount of work will be carried on with less energy consumption than when less work was carried out before the heart was failing and not under the influence of digitalis. This statement is based on good physiological reasoning which is based upon studies of eminent physiologists and clinicians engaged in studying the pharmacological action of digitalis.

I would like to recommend cedilanid in ampules for the treatment of severe left and right heart failure when at the bedside in emergency situations. It works promptly, I think almost as promptly as strophanthin, is less dangerous than strophanthin and used properly intravenously will give very good results within a few hours' time. I have seen patients with left heart failure come into the clinic with lung edema and terrific dyspnea, smiling and breathing easily within two or three hours following an injection of about 1.6 grams of cedilanid intravenously. I would recommend .1 gram of this drug per 10 pounds of body weight for intravenous injection, half of it to be given at once and the other half within an hour or two. I myself frequently give the whole dose in one intravenous injection. When I recommend it to others, I advise a little more cautious application because our clinical experience with this drug is a very recent one.

The mercurial diuretics as well as theobromine and theophyllin diuretics aid in the elimination of edema associated with the hypertension heart. Oxygen given by tent or by the Boothby mask, adjusting the flow meter at six liters, often helps strikingy in bringing about compensation, especially where coronary arteriosclerosis is present. Auricular fibrillation in hypertensive heart disease responds favorably to quinidine therapy in a higher percentage of cases if mitral stenosis is not present. I am convinced that the restoration of the contraction of the auricles aids the failing heart and probably reduces the tendency to auricular mural thrombosis and embolism.[3,9]

The treatment of the heart in hypertension is the same as the treatment of valvular heart disease except that occasionally we can reduce the strain on the left ventricle in hypertension by means of blood pressure reduction through the use of potassium sulfocyanate. This must be given cautiously, the level in the blood not being permitted to go over 12 mg. per cent, and should not be given if there is severe renal arteriosclerosis with reduced kidney function or if severe coronary disease is present. Therefore before beginning the treatment with potassium sulfocyanate, kidney function must be measured by the concentration test and the phenolsulphonphthalein test and a good history and electrocardiogram must rule out severe coronary disease in so far as this is possible. I usually start this treatment by giving 1 grain of the drug t.i.d. checking the blood level at the end of each week and increasing the dosage by one or two grains a week until a blood level of 12 mgm. per cent is reached or the blood pressure has dropped nearly to the normal. Up to the present time I have experienced no unpleasant results from this treatment, other than flushing of the skin, which is an indication for termination of the treatment. About 20 per cent of patients with high blood pressure will show marked drop in blood pressure, thus insuring in all probability some increase in life expectancy. Many patients will not respond with significant drops in blood pressure and a continuance of the drug is not to be recommended excepting for the relief of headaches. Another 20 per cent will show moderate degrees of fall in blood pressure which should encourage the further use of the drug in these cases as an aid in prolonging life expectancy. The patients are treated ambulatory but the blood level, the blood pressure, and the patient should be checked at

monthly intervals for the sake of safety in giving this drug which can produce very unpleasant symptoms if not cautiously administered and checked.

Bibliography

1. Decherd, G., and Visscher, M. B.: Energy metabolism of the failing heart. J. Exper. Med., 59:195, 1934.
2. Fahr, George: Hypertension heart. Am. J. M. Sci., 175: 453, 1928.
3. Fahr, George: The treatment of cardiac irregularities. J.A.M.A., 111:2268, 1938.
4. Fahr, George, and Buehler, Martin S.: A physiologic definition of acute congestive heart muscle failure. Am. Heart J., 25:211, 1943.
5. Fahr, George: Unpublished experiments done on heart-lung preparation.
6. Green, H. D.: The coronary flow in aortic stenosis, in aortic insufficiency and in arterio-venous fistula. Am. J. Physiol., 115:94, 1936.
7. Gregg, D. E.: Phasic and minute coronary flow during acute hypertension. Am. J. Physiol., 114:609, 1935.
8. Starling, E. H., and Visscher, M. J.: The regulation of the energy output of the heart. J. Physiol., 62:243, 1927.
9. White, Paul D., and Blumgart, H. L.: Cessation of repeated pulmonary infarction and of congestive failure after termination of auricular fibrillation by quinidine therapy. J. Mount Sinai Hosp., 8:1095, 1942.

PSYCHOSOMATIC ASPECTS OF HYPERTENSION

A Review of the Literature

WILLIAM H. HENGSTLER, M.D.
Saint Paul, Minnesota

ONE of the formidable problems confronting the medical profession today is hypertension. In any discussion of this subject one must remember that we have only limited knowledge of its causes and that most of the theories involving causation are still controversial and still not thoroughly investigated or proven. Statistics show that in the United States there are about 140,000 deaths every year which are due to hypertension, and that millions of other individuals suffer from it. Statistics of the Metropolitan Life Insurance Company show that almost one quarter of all people past the age of fifty years die from the effects of hypertension in one or another of the vital organs. It appears to be confined largely to occidental civilization. Studies that have been made of African natives, native Chinese, and other races lead to the conclusion that hypertension is relatively rare among those people. Observers have found that the occurrence of hypertension in the southern negro is two and one-half times greater than that of the southern white person and Metropolitan Life Insurance statistics indicate that hypertension runs a more severe course in the negro than in the white man. It is also interesting statistically that the blood pressure of foreigners living in China and in the tropics is lower than when they live in a temperate zone.

In considering hypertension, one must divide it into two great classes. In the first class fall a large number of cases which are secondary to kidney disease, suprarenal tumors, toxemias of pregnancies, and other frank physical disorders. The second class consists of those cases showing progressive elevation in both systolic and diastolic blood pressure in individuals who have no physical disease demonstrable and in whom there is an absence of arteriosclerosis, kidney disease and other possible causative disease. To this second class is applied the term "essential hypertension" and it is with this group that this discussion is concerned.

In studying the causes of essential hypertension, one must consider kidney disease, age, heredity, and the physiological and psychological backgrounds of the individual as well as disorders of the glandular systems in pregnancy or in the menopause and such other entities as tumors of the suprarenal glands. It must be remembered that there are normal fluctuations in blood pressure. Even hypertensives show wide fluctuations in their blood pressure. When the patient is up and around, variations will come, which may range from a few to several millimeters of mercury and during periods of rest there may be minor fluctuations in either hypertensives or normal individuals. In severe hypertensives one frequently encounters periodic fluctuations, where, for a period of months at a time, the blood pressure will, for no apparent reason, have a substantial elevation, which will be followed by a lower level for a period of several months more, for no apparent reason; all of which tends to prove that the etiology of essential hypertension is probably multiple and that the causes are complex in nature and up to the present time little understood.

Blood pressure is, undoubtedly, maintained and

Read at the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, May 18, 1943.

varied physiologically though the manner in which this occurs is still obscure. There are three factors which may be considered in this governing mechanism. These are first, physical factors, such as the force of the heart beat, etc., second, nervous factors, which are concerned in the regulation of the size and caliber of arteries and capillaries, and, finally, chemical agents in the circulating blood, which, presumably, come from the kidneys or endocrine glands, and which seem to act upon the walls of the blood vessels, increasing or decreasing their caliber. There is little definite knowledge at this time about these chemical agents although theoretically they appear to be the most important factor in the cause of essential hypertension. According to the preponderance of present-day opinion they come from the kidney. For twenty-five years or more the conclusion had gradually been formulated that essential hypertension was not caused by kidney disease. However, the experiments of Goldblatt have demonstrated that a persistent hypertension in animals can be produced experimentally that has all the characteristics of essential hypertension in man. Goldblatt has produced this condition by applying a silver clamp to the renal artery and producing renal ischemia. Varying degrees of ischemia in the kidney are produced by regulation of this clamp. Within a short time persistent hypertension follows, which varies directly with the degree of ischemia in the kidney. Also, changes in vessels and organs like those resulting from essential hypertension in man are produced and are especially well seen in the retina as they are in the human. In the opinion of Weiss and English these experiments of Goldblatt lead us back to the theory of renal origin of essential hypertension. They ask "is the hypertension produced through intermediation of the nervous control of the kidneys, that is, nervous reflexes from the ischemic kidney, causing a generalized vaso constriction, or is it a humoral mechanism? Is the ischemic kidney producing some effective substance which acts through the blood stream to produce a generalized vaso constriction?" They go on to state that the first question seems answered in the negative because regardless of what is done to the sympathetic nervous system of the dog, nothing will lower the blood pressure after the renal clamps are applied. They state that the whole sympathetic nervous system can be removed without lowering the hypertension. The work of Goldblatt and other experimenters also suggests that the endocrine glands are not important in causing hypertension associated with ischemia of the kidney, but that they are important in determining the degree to which the blood pressure responds to this ischemia. Weiss and English also state that "Evidence is accumulating which suggests the renal origin of essential hypertension in man in a manner comparable to that of experimental hypertension in animals." It may also be considered possible, therefore, that normal variations in blood pressure may be due, to some extent, to the action of these theoretical chemicals which the diseased kidney either adds to or fails to subtract from the circulating blood.

The psychosomatic aspect of hypertension embodies the study of the entire individual. "The concept of psychosomatic medicine is that man and his environment form an interacting unit and that mind and body are aspects and not parts." The relationship which exists between psychological processes and resultant physiologic reactions in the individual is still controversial. Weiss and English in "Psychosomatic Medicine" illustrate a summary of the pathogenesis of essential hypertension by a diagrammatic pyramid, which represents the hypertensive individual with his heredity and environmental acquisitions. The base of this pyramid is made up of constitutional and hereditary factors. The sides consist of interrelated factors such as gland systems, kidney and arterial disorders, and anxiety, emotional stress, and unconscious conflicts. The psychosomatic aspect of hypertension envisions causes arising both in heredity and environment. Hereditary causes render the individual incapable of making proper adjustments to problems found in his environment and, therefore, the individual reacts adversely due to a combination of these factors. As a result of reacting adversely to the problems of his environment, tension develops for which there is not adequate relief. This, in turn, causes certain somatic disturbances which result in hypertension. The psychosomatic aspect emphasizes concealed hostility and aggression which are repressed and thereby increase tension. Weiss and English state, "Investigators, notably Alexander and Saul, find that hypertensive patients show external friendliness and self-control, beneath which there are strong aggressions and anxiety. The anxiety grows out of the danger which these repressed aggressions would create for the

security of the individual if they were allowed expression. It is as if the inner psychological tension of the aggression found expression through heightened arterial pressure****Latent hostility and repressed aggression are found in every neurosis, but the difference, as noted in hypertension, is explained by Saul, who finds the hostility in hypertensive persons to be intense, chronic, inhibited, near to consciousness and perhaps to motility, but not adequately repressed or bound as in an organized neurosis. He finds these people are neither able to satisfy passive, dependent wishes, nor to clarify the hostile ones and hence they remain blocked in both directions."

From the psychosomatic standpoint the treatment of hypertension stresses the treatment of the individual rather than the treatment of blood pressure. Careful investigation is advised to eliminate physical causes. Should these be found, they are, of course, dealt with properly. In essential hypertension, however, which presumes no physical cause, the treatment from the psychosomatic standpoint must embody a study of the individual with analysis of his conflicts and his emotional disorders. Attention of the patient must be directed away from the height of his blood pressure. Palmer calls attention to the factor of mental stress in essential hypertension. Weiss and English observe that rest and reassurance are the factors which are stressed in the usual medical management of the disease, but, they state, a patient cannot be reassured about his condition if his attention is constantly focused on his blood pressure and he certainly cannot rest if he is pre-occupied with ideas of a stroke, heart failure, and kidney disease. Palmer calls attention to the fact that when an individual reaches the hypertensive period of life he has formed definite habit patterns and that this type of individual has always been hyperkinetic and overactive and that he psychologically is full of hostilities and aggressions. He doubts the ability of the physician to change radically this basic pattern so late in life and concludes that the therapy of enforced rest for essential hypertension is open to question. He believes it more logical to follow Meninger's suggestion that the patient be allowed to use those forms of somatic exercise that he likes and that agree with his physical condition. He concludes that if the patient is allowed to express himself within sane limits, and if this expression is such that he can relieve his inner tensions by walking, golfing and working at his usual trade or calling, he will be happier and that it is doubtful whether his life will be shortened to any considerable extent.

Palmer points out that in the regulation of work a week-end outing is not sufficient therapy for a tense week of work and frustration. He believes that if difficult situations are met during the days of the week, the somatic exercise should be taken at those times instead of on the next week end. "The patient should have a program that would enable him to relax from his mental work during the day by taking some light physical exercise followed by a rest period more than once during the day." In addition, he believes that the home life should be planned without evening or night work and with frequent periods of light exercise and mental relaxation. Furthermore, vacations should be short and numerous rather than once a year. There should be long hours for sleep or rest in bed.

The psychosomatic concept of treatment for essential hypertension further stresses that the patient be allowed ample opportunity to air his troubles and that the physician extend to him a sympathetic and encouraging attitude. The patient should be encouraged to come in frequently and have reasonably long visits with the doctor, in which he is given an opportunity to talk over his problems and to air his troubles and to receive friendly reassurance from the physician. There is no object in prohibiting the use of alcoholic beverages, tobacco, or normal sex life. The psychosomatic aspect of treatment embodies the theory that the repressions and increased hostility and aggression, which results from denying the patient his normal mode of living, increase the tension within himself and thereby aggravate, instead of help, the hypertension. It believes that release of tension through normal habits of life, properly but not too strictly regulated, is advisable. It believes, furthermore, that fear and anxiety generated by constant advice from the doctor to be careful because of the danger of a stroke or heart failure, or some other catastrophe, are definitely detrimental in the treatment of essential hypertension. The psychosomatic aspect advocates proper medical management, but no surgical intervention. It advocates analysis of the personality of the patient with release of ten-

sion through psychological means, thereby setting in motion the proper psychosomatic mechanism whereby blood pressure will be lowered, and whereby the life of the individual will be least disturbed and the happiness of the individual not destroyed.

Summary

One of the formidable problems confronting the medical profession is hypertension, the causes of which are not competely known. In the United States there are about 140,000 deaths every year, which are due to hypertension and millions of individuals suffer from this condition. It appears to be confined largely to occidental civilization. Studies which have been made of African natives, the Chinese, and other races produce the conclusion that hypertension is relatively rare among those people. Observers have found that occurrence of hypertension in the southern American negro is two and one-half times greater than that of the southern white person. Metropolitan Life Insurance statistics indicate also that hypertension runs a more severe course in the negro than in the white.

In studying causes of hypertension one must consider kidney disease, arterial disease, age, and the physiological and psychological background of the individual. There are normal fluctuations in blood pressure. It is maintained and varied physiologically in a manner not well understood. Three factors may be considered in this governing mechanism. These are physical factors such as (1) the force of the heart beat; (2) nervous factors which are concerned in the regulation of the size of arteries and capillaries; (3) chemical agents, presumably from the kidneys or endocrine glands, which seem to act on the walls of blood vessels, increasing or decreasing their caliber. There is no exact knowledge about this regulating and controlling mechanism, but various theories have been advanced, of which the preceding seems one of the most rational.

The psychosomatic aspect embodies the study of the entire individual. "The concept of psychosomatic medicine is that man and his environment form an inter-acting unit and that mind and body are aspects and not parts." From this point of view in considering the causes of hypertension one has to envision, therefore, causes arising both in heredity and in environment. Heredity is responsible for inability to make proper adjustments found in the environment. Therefore, the individual reacts adversely due to a combination of these two factors. This adverse reaction results in tension for which there is no adequate release, which, in turn, causes certain somatic disturbances resulting in hypertension.

From the psychosomatic standpoint the treatment of hypertension stresses the treatment of the individual rather than the treatment of the blood pressure. Physical causes such as kidney disease, arterial disease, or glandular disorders should, of course, be dealt with properly. In the so-called essential hypertension, however, which presumes no physical cause, the treatment must embody a study of the individual with analysis of his conflicts and his emotional disorders. Attention of the patient is directed away from the height of his blood pressure. He is given an opportunity to release, through his medical advisor, the conflicting forms of tension which exist in him due to his improper reactions to his environment and his fundamental maladjustments. He is given reassurance and is advised to turn his attention away from his blood pressure and to lead a normal life in so far as is possible. The psychosomatic concept believes that the various surgical procedures devised for treatment of hypertension cannot be expected to lower the blood pressure by a pure physiologic means such as relieving constriction of the smaller blood vessels or by decreasing the secretion of adrenalin. Psychosomatic medicine believes that psychotherapy is the most important part in the treatment of hypertension and that its wide use is to be encouraged. It believes in medical management, but that the wide use of operation is not to be encouraged.

Bibliography

1. Hamilton, James Alexander: Psychophysiology of blood pressure. Psychosomatic Med., 4:125-133, (April) 1942.
2. Katz, L. N., and Leiter, Louis: The present conception of essential hypertension. Psychosomatic Med., 1:101-117, (Jan.) 1939.
3. Palmer, Dwight M.: Psychosomatic considerations in essential hypertension. Ohio State M. J., 35:1087-91, (Oct.) 1939.
4. Raab, W.: Hormonal, central and renal origin of essential hypertension. (Cerebral and renal arteriosclerotic ischemia as casual factors.) Ann. Int. Med., 14:1981-2007, (May) 1941; Arch. Int. Med., 68:713-739, (Oct.) 1941. Abstracted in the 1941 Year Book of Neurology. Psychiatry and Endocrinology.
5. Robinson, S. K.: A comparison of the medical and surgical treatment in hypertension with special reference to the importance of psychic factors in evaluating the results, with a report of ninety-two cases treated medically. J. Nerv. and Ment. Dis., 91:157-174 (Feb.) 1940.
6. Schimmenti, John M.: Some remarks on the cause of essential hypertension and its prevention by psychotherapy. M. Times, 67:413-8, (Sept.) 1939.
7. Stern, K.: The relation of arteriosclerosis and arterial hypertension to mental disorder. Canadian M.A.J., 45:513-17, (Dec.) 1941.
8. Weiss, Edward: Psychosomatic aspects of hypertension. J.A.M.A., 120:1081-6, (Dec. 5) 1942.
9. Weiss, Edward: Cardiovascular lesions of probable psychosomatic origin in arterial hypertension. Psychosomatic Med., 2:249-264, (July) 1940.
10. Weiss, Edward, and English, O. Spurgeon: Psychosomatic Medicine. Chapter 5, pp. 105, 157. W. B. Saunders Company, 1943.

MEDICAL MANAGEMENT OF EARLY CASES OF HYPERTENSION

SIMON G. SAX, M.D.
Duluth, Minnesota

WHILE the medical management of the early cases of hypertension may appear disappointing in specificity, none the less, I feel a buoyant and enthusiastic attitude toward the treatment must be maintained by the attending physician. These early cases, which are uncomplicated as yet by the "wear and tear" of hypertension of longer standing, require special attention in order to shield and buffer the body against the pathological changes occurring in the more advanced hypertensive individuals. I consider the early cases as the uncomplicated cases, early not from the standpoint necessarily of time, but rather from the standpoint of freedom from complications in the heart, the kidneys, and the brain.

Certainly there may be some early hypertensives who require no drug therapy and little supervision. Recently Master and his colleagues[9] tell us that hypertension at the age of forty or over is so common that a mild degree or perhaps a moderate degree can no longer be considered abnormal. Many of us might have difficulty in accepting this opinion.

Hypertension, however, is a very serious condition. Approximately 25 per cent of all deaths after the age of fifty are due to hypertension. Well over 250,000 people per year die from hypertension or its sequelæ.

Confusing indeed must it be to the practicing physician who daily is circularized through the mail, in medical advertisements, or by detail men on the alleged miraculous hypotensive drugs striking in complexity, varying in nature, comprising everything from the Vitamin A to the Viscum Album (extract of mistletoe).

Treatment of the hypertensive must further be considered with two objectives in mind: (1) the relief of symptoms; (2) the lowering of blood pressure. If we are to draw any conclusions from the legion of publications one can readily observe that relief of symptoms is more frequent of accomplishment than is lowering of blood pressure. Further, the fact that blood pressure readings in the hypertensive are labile and not static is only too well known to all of us.

Read at the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, May 18, 1943.

Ayman[1] has stated that the symptoms associated with hypertension "may be relieved by mental suggestion inherent in any seriously or enthusiastically prescribed method of therapy." Parenthetically, confidence in the doctor by the patient would appear all important.

Our capacity for reducing the blood pressure is not so encouraging as is our ability to relieve the symptoms. Goldblatt, Kahn, and Lewis[4] in their experimental work on the dog in which blood pressure elevation was established by the Goldblatt clamp were uniformly not successful in reducing the blood pressure with a long list of substances which had been used or are still being used in the treatment of human hypertension. Their work was exhaustive; their results, uniformly negative. Obviously, the psychogenic factors were not so markedly present in the dog as they are in the human. Certainly all of their negative therapeutic results cannot be bodily transferred to interpretation for the human. None the less, we must adopt a critical attitude toward the many so-called hypotensive drugs and hypertensive therapies.

Sedation has certainly earned a place for itself in the management of the hypertensive. The central nervous system depression with its attendant mental relaxation and rest afforded by the barbiturates and allied drugs are indeed helpful. The dosage, of course, must be individualized for the patient and prescribed to meet the varying situations. A good night's sleep is all important. A new schedule for life must be established. Insults to the vascular system can often be avoided by teaching the patient to relax. A good dictum for the hypertensive would certainly seem to be—relax and you'll last longer.

From an academic standpoint, since hypertension is associated with increased arteriolar resistance, the vasodilators would appear to be the drugs of choice in the treatment of early hypertension. However, many unpleasant symptoms are at times associated with their use. While glyceryl trinitrate (nitroglycerin) administered beneath the tongue and amyl nitrite administered by inhalation are helpful in angina pectoris, other

longer lasting nitrites such as sodium nitrite and erythrityl tetranitrate (erythrol tetranitrate) have failed to receive much popularity in the treatment of the hypertensive because of the unfavorable symptoms produced of headache and palpitation, which are often more distressing than the disease itself.

The xanthine derivatives such as aminophyllin, phyllicin, and related drugs are highly popular in the management of the hypertensive, perhaps less by reason of any known lowering of blood pressure or relief of symptoms, but rather with the hope that the vasodilation so produced will be helpful in avoiding later complications. Their use in liberal dosages would seem to be justified.

Thiocyanates afford great help in certain early cases of hypertension. In approximately 50 per cent of the cases, a lowering of the blood pressure is noted with an allaying of certain disagreeable symptoms. The systolic blood pressure is more readily influenced than is the diastolic so that the lowering of the mean blood pressure is often not so startling.

Barker[2] in 1936 suggested the need for blood cyanate concentrations of 8 to 12 mg. per cent in acting as a good guide to effective treatment and to avoid intoxications. Massie and his associates[6] have recommended a somewhat lower optimal blood cyanate level of between 5 to 7 mg. per cent. The guide to the proper dosage, obviously, is the blood level and the relief of distress. The amount of the drug required to do this is highly variable, often 3 to 15 grains per day. Some patients require only 3 or 4 five-grain doses per week for maintenance. Weekly blood concentration determinations should be made until the dosage is established. Then a blood concentration determination should be carried out at least once a month to check this proper level. The exact mode of action of the thiocyanates in reducing blood pressure is not understood.

A great variety of unfavorable symptoms is sometimes noted with thiocyanate therapy such as skin eruptions, nausea, vomiting, diarrhea, mental confusion, precordial pain, delirium, convulsions, and even death. The ability of the kidney to excrete the thiocyanate is obviously important. In early hypertensives this is not so clearly a factor since kidney function is usually intact. However, as Russell and Stahl[11] have pointed out, some individuals have an idiosyncrasy for the drug so that there is a relatively low margin of safety between the therapeutically effective dose and the fatal one. An intelligent and coöperative patient is certainly very helpful. Continuation with the drug after improvement is noted is important since the discontinuance of the drug usually brings forth a return of symptoms. Obviously, cyanates are not a cure for hypertension. The drug seems more effective in hypertensive individuals who have a macrocytosis[3]. Potassium thiocyanate when used intelligently with proper blood determinations as a guide is a helpful aid in some cases of early hypertension.

Diets have often been advised for the treatment of hypertension. There has been little evidence to support the restriction of protein or the limitation of salt in the diet of the early hypertensive. Obviously, the obese individual could well reduce to the proper weight for his height and age in order to protect the heart from useless work. Hypertension and obesity frequently occur together, representing perhaps a constitutional familial disorder. This loss of weight does not necessarily carry with it a drop in blood pressure.

Certain hygienic measures are properly instituted in the management of the early hypertensive. Constipation when present obviously should be corrected. While it may be controversial, it would seem well that tobacco be restricted as much as possible. This is particularly true in those sensitive individuals in whom smoking causes an added blood pressure elevation or who are unusually stimulated by smoking. In line with a philosophy of moderation in all things, alcohol would also be best restricted and, if necessary, eliminated. Mild exercises or restricted exercises, adapted to the individual, are perfectly satisfactory.

Hypertensives do not tolerate hot weather well. It has been shown that the blood pressure of many such individuals often rises in hot rooms. Further, frequent vacations are helpful.

The humoral mechanism for hypertension advanced recently in this country by Page and his workers[10] and by Houssay and his South American group[7] represents a new and fascinating interpretation of the subject with the possibility of further developments. The secretion of an enzyme called renin by the ischemic kidney, the action of this enzyme on a blood globulin (renin activator or hypertensinogen) giving rise to a substance —angiotonin or hypertensin—which is

vasoconstrictor in action gives freshness to the subject. Further, the neutralizing effect of a substance—"hypertensinase" in the normal individual which destroys this vasoconstrictor material is indeed interesting.

Grollman, Williams and Harrison[5,6] as well as others have reported on the treatment of hypertension with renal extracts. Their ability to reduce blood pressure by these depressor substances from the kidney was at times startling. As yet, this work is in an experimental stage. The drug apparently is costly. It would appear too early as yet to draw any conclusions from a general clinical viewpoint. We do not know much about the treatment of hypertension with renal extracts over a period of time—over a period of years. Houssay and Braun-Menendez[7] in a recent publication fully cover the possibilities of specific treatment of hypertension based on the humoral interpretation from an academic and research viewpoint. However, we are not as yet able to give full clinical application to their suggested therapy with the various elements of the renal extracts. This aspect of the subject may be promising. It may yet afford a basis for specific treatment of early hypertension.

These South American authors[7] end with "the hope that in the near future research will give medicine a more powerful method to fight arterial hypertension." I, too, may well end with this hope.

Bibliography

1. Ayman, D.: An evaluation of therapeutic results in essential hypertension. I. The interpretation of symptomatic relief. Jour. Am. Med. Assn., 95:246-249, (July 26) 1930.
2. Barker, M. H.: The blood cyanates in the treatment of hypertension. Jour. Am. Med. Assn., 106:762-767, (March 7) 1936.
3. Doles, H. M.: Mode of action of sodium sulphocyanate in reducing hypertension, with a report of its effect on the erythrocytes. South. Med. Jour., 32:299-302, (March) 1939.
4. Goldblatt, H., Kahn, J. R., Lewis, H. A.: Studies on experimental hypertension. Jour. Am. Med. Assn., 119: 1192-1201, (Aug. 8) 1942.
5. Grollman, A., Williams, J. R., Jr., Harrison, T. R.: Reduction of elevated blood pressure by administration of renal extracts. Jour. Am. Med. Assn., 115:1169-1176, (Oct. 5) 1940.
6. Grollman, A., Williams, J. R., Jr., Harrison, T. R.: Effects of renal extract on hypertension. Bull. New York Acad. of Med., 18:190-199, (March) 1942.
7. Houssay, B. A., and Braun-Menendez, E.: The role of renin in experimental hypertension. Brit. Med. Jour., 2:179-181, (Aug. 15) 1942.
8. Massie, E., Ethridge, C. B., O'Hare, J. P.: Thiocyanate therapy in vascular hypertension. New England Jour. Med., 219:736-740, (Nov. 10) 1938.
9. Master, A. M., Marks, H. H., Dack, S.: Hypertension in people over forty. Jour. Am. Med. Assn., 121:1251-1256, (April 17) 1943.
10. Page, I. H., and others: Substance in kidneys and muscle eliciting prolonged reduction of blood pressure in human and experimental hypertension. Proc. Soc. Exper. Biol. and Med., 43:722-728, (April) 1940.
11. Russell, W. O., and Stahl, W. C.: Fatal poisoning from potassium thiocyanate treatment of hypertension. Jour. Am. Med. Assn., 119:1177-1181, (Aug. 8) 1942.

GENERAL CARE OF THE AGED

J. F. NORMAN, M.D.
Crookston, Minnesota

AT a time when we are endeavoring to raise and to maintain an army of some 11,000,000 men, we are becoming conscious of the great number of aging people in our population. In 1941 these people aged sixty years and over numbered 13,600,000. There were 9,200,000 in the age group over sixty-five years. With such a group, many of whom are dependent or incapacitated by disease or age, we have a problem which is both economic and medical. This group of thirteen million persons will require more than average care whether employed and self dependent or not. Their disabilities will be more of a chronic nature of long duration. As the proportion of younger persons in the population declines, and the acute and infectious diseases are mastered, there will be an increasing number of involutional and degenerative conditions which will make up an increasing portion of the physician's practice. With such a group the physician must now be prepared to work. To do so will require renewed study of the process of aging and of the disease conditions which are peculiar to this age period.[6]

This table is presented to call attention to the large number of aged people, ten per cent of the whole population, or 13,600,000 sixty years and over. It is encouraging to note that 2,700,000 at sixty years and over are self-dependent because of current earnings. This table will also bring out the small number of patients provided for in homes, only 145,000 out of 7,300,000 dependent people and an additional 102,000 in hospitals for mental disease.

The rapid increase of the aged in the popula-

Read at the annual meeting of the Minnesota State Medical Association, Minneapolis, May 17, 1943.

DATA RELATIVE TO EXTENT OF DEPENDENCY AMONG AGED[10]

Status of Persons Sixty Years of Age and Over Dependent Primarily on Specified Means of Support	1941	
	60 Yrs. and over	65 Yrs. and over
Total estimated number of persons in U. S. A.	13,600,000	9,200,000
Self-dependent	6,249,000	3,382,000
By reason of		
1. Old age and survivors' insurance under Social Security Act	100,000	100,000
2. Municipal pensions and private industrial pensions	159,000	137,000
3. Insurance annuities	428,000	338,000
4. Savings, real estate, or securities	2,291,000	1,290,000
5. Current earnings	2,770,000	1,040,000
Dependent	7,351,000	5,218,000
1. Supported wholly or partially by public or Social Agencies	3,025,000	2,586,000
a. in receipt of general public assistance (unemployment or poor relief)	410,000	160,000
b. in receipt of organized private charity	15,000	10,000
c. in public homes	65,000	53,000
d. in hospitals for mental disease	102,000	88,000
e. in private homes for aged	80,000	53,000
2. On children, other relatives, and friend (wholly or almost wholly)	4,326,000	2,632,000

(From Shearon, Marjory: Old Age Pensions, S. Res. 129, 77th Congress, 1st Session, U. S. Government Printing Office, 1941. Taken from—The Care of The Aged, Thewlis—1942.)

tion is a phenomenon of modern life. Among wild animals very few individuals live much beyond maturity. As soon as there is some slowing up some predator terminates the life of the slow or ill. Primitive man must have had a small number of survivors past middle age. Such savages were food gatherers and not food producers, and the result was that food scarcity was the normal condition among the less favored of them. Surprisingly enough some did survive to late life as is attested by the fossilized remains of some few individuals. The bony remains of such primitive men have been found in France and elsewhere, Neanderthal in type, and must date back thirty-five to fifty thousand years or more. Age was proved by the senile type of jaw with extrusion of the teeth. The skull of the "Old Man of Cro-Magnon" was another such find, perhaps dating back thirty thousand years.[5]

There are few very old individuals among the Egyptian mummies and these show the involutional changes of aging. Down through the centuries there was very slow improvement in life expectancy and it was not until comparatively recent years that marked improvement has taken place.

The stress of modern living has been blamed for many of the degenerative diseases of old age. It would seem that the primitive food gatherer must have had a much more exciting life than ours, and, in so far as he was capable of reasoning, his must have been a life of constant mental stress. It is true that the diseases which we associate with old age are not often found among primitive peoples, the main reason being that their lives are short and that they do not enter the period of life where such conditions are common. Where their living conditions are improved, their life expectancy increases and then the neoplasms, cardiorenal diseases and other degenerative conditions appear. Such changes are due not so much to civilized living conditions and civilized food as to added years of life.

The 1940 census brought to our attention the fact that while this increase in life expectancy has been rapid in the last generation most of the gain has been in the reduction of mortality in the younger age group. This increased expectancy is due to improvement up to ten years and with very little improvement after sixty years. In Minnesota in 1870 40 per cent of all deaths were in children under nine years and 75 per cent of deaths were persons less than forty years of age. At present only 8.2 per cent of deaths are under five years, 19 per cent up to forty years, and less than half of deaths before sixty years. More than half of our Minnesota pioneers were under twenty-one years during territorial days.[7]

The accompanying table for Duluth, Minnesoto, illustrates this trend very well. This was prepared by Dr. E. L. Tuohy, Duluth, Minnesota.[11]

AGE LEVEL EXTENSIONS
Duluth, Minnesota

	1900	1937	1940
Average Age at Death	26.79	58.65	62.00
Deaths under one year	24%	5%	5.2%
Deaths over 75	4%	25%	32.1%
Deaths at 45 or over	24%	79%	83%

Dublin[2] has pointed out that this group of aged people will increase threefold in numbers in the next fifty years if present trends continue.

While the number of workers of twenty to sixty-four years will remain about the same, the ratio of the aged to the workers will change from the present six to fifty-six upward to seventeen to fifty-six by 1980. There will continue to be a drop in the age group below twenty years. The present wartime increase in birth rates will not change present age trends for thirty years. In a totalitarian state this problem might be adjusted easily. The young would be valuable and every effort would be made to preserve them for future soldiers and mothers of soldiers. The infirm among the aged would be an economic liability to the super state. The weak and helpless, especially the mental cases, might be "liquidated."

There may be some unthinking neglect of the aged. Human sympathy may be very ready but its application to the problems of the aged may not be very practical and this often applies to the relatives and friends of the aged patient as well as to the public. Perhaps the medical profession may not have given this subject the study it deserves; because of evident senile changes the patient was not given the attention needed.

With such increase in the number of aged persons in the population, medical practice will have to adjust itself. The physician must determine whether any illness is due to disease or to aging. These patients are subject to many of the illnesses of younger people and are prone to a group of disease conditions peculiar to their age group. While in youth, disabling illness is likely to be acute and of short duration, in old age, illness may be of a type which will last weeks or months. Morbidity statistics are affected by the increased age of these patients, this group having not only a high mortality rate but also a high rate of disabling sickness. The number of invalids per thousand increases rapidly with the years; while the average rate was eleven per thousand for all ages, the number of invalids per thousand between the ages of sixty-five and seventy-four was 53.5. Many of the changes noted may not be due to aging but to some form of organic disease. Practice of medicine will depend much on the age level of the population.

The medical profession through immunization, better sanitation and improved medical care has been largely responsible for this increase of the aged among us. The profession must meet the challenge of this responsibility of caring for these people; added years without comfort would be worthless. The profession will have to adjust itself to such practice as larger numbers of the physicians' patients will be from this class, which has increased thirty-five per cent in numbers since 1930.

The aged may be divided into three classes from the point of view of care.

1. Those who are fairly active, mentally clear, and who continue to some degree in their work or profession.
2. Those who may be physicially disabled but mentally fairly normal. They may have retired on a competence or they may be dependent.
3. The aged who are helpless. This may be mental or physical.

For these old people in the first group who are willing to work, the most logical thing would be to have them continue, the work perhaps modified so that there may be less responsibility and less physical strain. Previous to the war there was a tendency to voluntary or forced retirement at the age of sixty-five. Many of these retired workers were at a loss and without zest for living. On his part the worker should be willing to accept a change in work with possibly a lower wage.

Carlson[1] has summed up this employment situation in a recent article. He emphasizes how well the present labor shortage has proved the worth of the older worker and that work will improve the health and mental attitude of these people. He believes that a life of leisure should not be held up as the aim of the worker or professional man of sixty-five years. He believes that while Social Security for our aging population is right in principle, it should take some form of useful work or other service which these people can give and not in the form of pay for doing nothing.

During the present emergency many of these older workers have been called back into industry, and among the professional men are many retired physicians who have been brought back to fairly active work, much to their increased happiness. They feel that they are helping with the world's work and they keep in better health.

It seems that some large industrial concerns continued to employ men up to eighty years, both

in ordinary labor and in the skilled trades. Edsel Ford[3] reported that while in 1900 only 23 per cent of his employes were between ages of forty and sixty-five, this number has now increased to 37 per cent in that age group. The Douglas Air Craft and Chrysler Corporations both continue to employ old workers; the Dodge plant has an "Old Man's Division" of ninety-nine workers whose age average sixty-six years with some of them over eighty years. This experiment has been under way since 1934 and it is not due to the abnormal conditions of the war. Aged agricultural workers are valuable and the life should be healthful. It is of interest to know that the estimated number of individual wage earners in the Twin Cities area in 1938-39 was over 24,600 persons aged sixty years and over out of a total of 300,000, or about 8 per cent.[8] The employment of these people is emphaized here as it is felt that such occupation is often a prophylactic measure and may be curative in those who are depressed because of being out of the activities around them.

With those who are physically disabled but mentally normal, a different problem arises. Many of them find ways to be useful and can perform some degree of service. Many will be dependent on family or on the public and they are justly entitled to sufficient aid to keep them comfortable. Medical service should be such that they do not suffer needlessly. The happiest environment should be in their homes as long as possible, deferring institutional care until it becomes a necessity. Some light work is helpful and interest should be developed in a hobby or avocation. Putting these old people into new surroundings, away from home and relatives, in the company of helpless individuals, will tend to hasten mental changes and to bring the patient into the class of the completely helpless old men and women.

The third group, the mentally or physically helpless, belongs definitely in some institution. At present our small hospitals are crowded with such patients who take up rooms needed for the usual hospital patient. They are hard to manage and their care is time-consuming. It is questionable whether such care is as good as could be had in a sanitarium devoted entirely to such cases. It would seem that sometime there will be some such plan as that provided for tuberculous patients on a county-wide basis. On January 1, 1943, 18 per cent of the population of the local hospitals in Crookston were patients of sixty-five years or older. True, many of them were surgical or medical cases which would stay but a short while. About half of them were helpless, senile individuals who were sent in because there was no other way to care for them and many of them remain until death.

While preventive medicine has been largely responsible for the vast savings in human resources among the young, it cannot be applied in mass effort in the care of the aged. The application of preventive geriatrics will be individual and will not be concerned with preventing aging. We can only hope to modify the consequence of aging. This distinction and definition is made by Steiglitz.[9] The effort should be made, he states, to try to modify the process of growing older so as to avoid some of the tragedies of long years without health. A periodical health examination would be necessary and should be complete. Steiglitz perfers to call it a health "inventory." As the patient grows older he should learn something of the problems of advancing age. Careful examination or "inventory" may discover some of the early signs of cardiovascular abnormalities which may be modified by proper care. Any change in function of any organ will be noted and investigated as will any change in general well being.

Very early diagnosis may mean eradication of malignancy, conservation of a failing heart, or prevention of further damage in genito-urinary conditions. At this period an effort should be made to encourage the patient and so try to prevent some of the depressive mental states which are common without organic background.

One of the first difficulties encountered in caring for the aged is their indifference to health matters. They are inclined to postpone taking care of themselves and to neglect such conditions as bleeding, new growths, loss of weight, or recent "indigestion." It is difficult to determine what method would best succeed in getting these people to apply for and to accept adequate care early enough. In a recent cancer control study in Connecticut, of 158 successive cancer patients admitted to the New Haven Hospital over 80 per cent had delayed seeking or following medical advice.[4]

The question of exercise for the aged is one that should be discussed with each patient. The aged worker may be getting enough evercise. The ambulant patient should have exercise fitted to his case. As a general rule strenuous exercise after sixty is not beneficial and may be harmful. Too often the aged person will want to prove himself strong and well. He may overdo and the result may be bad. Such a person should have advice on the matter and he should be told that no exercise or system of exercises will bring back wasted aged muscles or keep them from wasting. Exercise never has brought back a failing heart to normal and does not delay any of the other changes due to involution. There is danger in sudden spurts of exercise and some patients will experience shortness of breath, chest pain or pain in the legs. These are warnings. In the North we have the example of sudden death shoveling snow, pushing a stalled car, or other sudden overwork when the temperature is very low. Moderate exercise is of decided benefit and has the added value of getting the patient into pleasant contact with others.

Rest periods should be regular and the old person should have good noon time rest. A long night's rest should be the rule. These rest periods should alternate with exercise, graduated to the condition of the patient. Every effort should be made to prevent these people from becoming bed ridden. The patient with a circulatory handicap would require more rest as would one who has any other disabling illness.

Summary

The family physician can best care for the aged in his community. He has known these people for years. He can advise and direct them. Care of the aged will be a large part of medical practice in the future; care for the aged workers that they may continue at work and for the helpless that they may be comfortable. The aged patient who is not helpless is better off at home where he may be in contact with relatives and friends. The helpless would be better off in sanitariums where more expert help could be had.

Cardiorenal diseases will constitute a great factor in the care of the aged in the future. Under mortality conditions prevailing in 1938, half of the babies born then would eventually succumb to degenerative diseases of the circulatory system and kidneys. The problem of cancer will continue to be of growing importance in the care of these people. The chances of dying of cancer are now about one in nine for males and one in seven in females. Respiratory diseases will continue to be important. Modern therapy in respiratory diseases helps less with the aged than with the young. Mental disease in old people will increase and provision will have to be made to care for these cases of senile psychosis and cerebral arteriosclerosis.[6]

The medical profession will need to adjust itself to a new type of practice. It should offer some leadership in an attempt to supply better housing and care for the helpless. The profession might profit from a complete study of these medical and economic problems that they may be able to offer some advice in any proposed wholesale reorganization plan of medical care.

References

1. Carlson, A. J.: The older workers. J.A.M.A., 121:806,810, (March) 1943.
2. Dublin, Louis J.: Medical problems of old age. University of Pennsylvania Bicentennial Conference Bulletin. Metropolitan Life Insurance Co. of New York.
3. Ford, Edsel: Why we employ aged and handicapped workers. Saturday Evening Post, 215:16, 17, (Feb. 6), 1943.
4. Harms, C. R., and Plaut, J. A., and Oughterson, A. W.: Delay in the treatment of cancer. J.A.M.A., 121:335-338, 1943.
5. MacCurdy, George Grant: Human Origins. 1:379-425. New York: D. Appleton and Co., 1924.
6. Metropolitan Life Insurance Co.: Statistical Bulletin Medical Practice and Our Aging Population, 22:1-3, (April) 1941.
7. Minnesota Department of Health: Our aging population. Packet, Minnesota State Medical Association, (Dec.) 1942.
8. Minnesota Resources Commission: Minnesota Incomes. St. Paul, 1938-39.
9. Steiglitz, Edw. J.: The potentialities of preventive geriatrics. New England J. Medicine, 225:247-254, 1941.
10. Thewlis, Malford W.: Care of The Aged, page 77. St. Louis, C. V. Mosby Co., 1942.
11. Tuohy, E. L.: Geriatrics, age level extensions for the City of Duluth. Packet, Minnesota State Medical Association, (Dec.) 1942.

BLACK EYE CAMOUFLAGED BY NEW PREPARATION

A quick, easy method to camouflage that black eye is offered by Dr. H. Goodman of New York, (*Pennsylvania Medical Journal,* June).

He prescribes a preparation of bismuth subnitrate suitably colored with carmine and calamine to match your skin. Soap and water cleaning of the discolored area, a layer of glycerin, then the powder and you can go home without embarrassment.—*Science News Letter,* August 28, 1943.

NUTRITIONAL MANAGEMENT OF THE AGED

EDWARD L. TUOHY, M.D., F.A.C.P.
Duluth, Minnesota

THOSE who have attained the seventh or eighth decades of life, and are comfortable and active, are not good subjects upon which to fasten dietary habits that run far counter to their own. Whatever they have used as their dietary guide, "it has worked."

However, that does not mean that they could not have done better. Many die too early or suffer handicaps that make living difficult, cramping both comfort and efficiency. Some general rules are crystallizing out of our increasing nutritional knowledge. It will require several generations to mold this knowledge into that subtle stabilizer we call "wisdom." The body, if left to its natural tendencies, disentangled from fads, excesses and periods of partial starvation, has an inheritance of wisdom that physiologists call "body balance." This faculty often makes adversity a friend and hard living a whetstone upon which bodies are hardened and souls saved. It is time to catalogue some nutritional guides for the aging. These principles are put down without much argument or elaboration. The ever-expanding medical and lay literature overflows with such details and propaganda. Certain references are appended.

1. Dietary training for those over sixty should begin in late adolescence, as soon as full growth is attained.

2. Thereafter, body build and family inheritances should be understood. By reasonable care, obvious underweight or decisive obesity may be averted. It is well to remember, however, that slide rules giving what are called "ideal weights" are taken far too seriously, and, especially with women, become a great source of faulty eating.

3. Protein adequacy for rebuilding and keeping up the component cells of all the organs of the body constitutes the first and prime demand. As age advances, those developing "body squeaks" are apt to shift too far to carbohydrate, and all too much of it is over-refined. A daily protein quota from lean meat, eggs, cheese and milk (cottage cheese), or possibly such substitutes as soybean is now stressed by all nutritionists.

From the Section of Internal Medicine, The Duluth Clinic, Duluth, Minnesota. Read in part in a symposium on Care of the Aged at the Annual Meeting of the Minnesota State Medical Association, Minneapolis, May 17, 1943.

This runs so counter to medical and public opinion of even two decades ago that the average physician loses the habit of ordering "soft, light or liquid diets" only after deliberate and consistent analysis of the factual data on food that have accumulated with a rush since vitamins were popularized a decade ago. More good has come indirectly for *our* population from this development that showed the advantages of a natural balanced diet than from the exhibition of the vitamins (single and mixed) themselves. We have not been catering to a people living off inadequate soils. Physiologists such as Carlson[6] hammering in the need of "omnivorousness" in man have led the way. The essential amino acids are taking their place with all other "essentials" —fatty acids, vitamins and minerals—in establishing that salubrious homeostasis so well documented by Cannon.[5]

4. This does not mean that carbohydrate is to be despised. Unfortunately the most primitive of tastes is that for sweet. Price[11] has shown how every cloistered primitive people, protected by traditions of food preparation and selection that automatically balance, revert to excess refined starch as soon as they move where it is freely available. Among other things they lose their teeth. Boyd[4] of Iowa University has thrown more light upon this much mooted tooth decay and pyorrhea problem by his intimate study of a group of diabetic children. Rampant tooth decay not only stopped but some cavities filled in when dietary balance was achieved and maintained. In fact, these children did not crave excess sweet when they had adequate protein and secured their needed energy release from the glucose in protein rather than from plain sugar. This is a very far reaching principle. Growing children get hungry. Nervous adults and poor breakfast eaters crave the immediate pick up given by candy or sugar drinks. The stage is set for unfavorable obesity especially where the family and constitutional tendencies thereto obtain. Then we are reminded that irritability both in the young and old is often appeased by eating from which was drawn one of the earliest references to hypoglycemia: "Hungry animals are quarrelsome." Carbohy-

drate is in nature the most abundant, cheapest and easiest stored of all foods. The over-processing that disposes excessively of minerals and vitamins will be gradually controlled.[14]

5. Fat is nature's storage item. The only protein that is not immediately built into body tissues and solutions is that portion broken down and its glucose content used as such. This is an expensive ration and one the body uses only when ordinary sugar is not available. When the liver and muscles are supplied with their quotas of sugar, that which remains is converted into fat. This is the lower animal routine which makes such types as the pig such remarkable forage concentrators. Fat—cream, butter, and lard—has great use but any excess of fat is disorderly and imposes certain hazards on some people especially after forty-five. This applies particularly to the naturally obese, people with high blood pressure in their family background, and early arteriosclerosis. Fat is the great food seasoner. It makes things "rich" and induces gluttony. It brings on gouty[12] attacks in those addicted thereto.

Peters[10] has recently written on this subject under the title "A New Frame for Metabolism." Those interested will find a physiological explanation of such terms as "starvation diabetes"*; details of "food priorities" in terms of adjustments that keep the liver intact; much more that explains what happens to those like Rickenbacker and his crew suddenly shut off from access to both food and water. This dramatic accidental imposition of dire starvation has its lesser counterpart in civil life in the sudden weight loss encountered in diabetes, exophthalmic goiter, Addison's disease, and, of course, gastrointestinal malignancy. Wangensteen[15] has been foremost among surgeons in planning to restore liver competency before attempting any major surgery. Starvation is indeed a menace in any period of life; but especially with the aged. Whatever the source, the liver fills with fat; and a fatty liver cannot perform its varied functions of blood and plasma restoration, vitamin, water and electrolyte storage, and a host of other homeostatic controls.

6. Insidious starvation obtains with many elderly people. A few general forms may be outlined, but many others abound.

(a) *The nervous and insane.*—Much is presently written concerning the dementia of pellagra or alcoholic confusion as seen in Korsakoff's syndrome. Much more general is that indifference to food so common with functional neuroses as well as the true psychoses. Involutional melancholia is a typical example.

(b) *Diabetes.*—Much caution is needed in adjudging the importance and meaning of glycosuria. It is well to center the attention in most elderly subjects showing glycosuria upon the liver rather than on the pancreas; upon the ability of the liver to function unhampered than upon the glucose level of the blood. The tissue starvation (break in carbohydrate metabolism) in middle aged or elderly diabetics is by no means as dangerous as the upset carbohydrate sequences occurring in Addison's disease.

(c) *Alcohol.*—This excellent, but far too expensive carbohydrate food, should continue to retain many abstemious friends. That it produces a type of liver exhaustion, because many "drunks" either cannot eat or concurrently provide for themselves an adequate balanced dietary, few longer deny. There are other causes of liver cirrhosis. Not all begin with the type of starvation seen where a quart of whiskey daily maintains weight but empties the liver of its glycogen reserves and supplants them with useless fat.

(d) *Mechanical impediments to food ingestion.*—These should be considered in terms of any interruption from the oral entrance to the ultimate blood vessel system that carries oxygen and food to the tissues. Practically we are concerned with ingestion, absorption and portal patency. Of these, less is known about breaks in absorption than science will ultimately unfold. Thus ulcerative colitis and ileitis or sprue visit a variety of insults upon the liver and the patient out of proportion even to small intestine external fistulæ. Ivy points out that the average healthy man's small intestine would function well for at least 200 years. Nevertheless, as age advances many people do not seem to get the full benefit their estimated diet should provide. Without diarrhea, vomiting or unusual anorexia they still have hypochromic anemia or, what is more obvious, a decided tendency to osteoporosis; and the body seems to prefer the skeletal calcium to any available in the intestine. Gastric achlorhy-

*The liver appears to insist upon restoring its glycogen stores before the muscles and other tissues are permitted to burn and utilize glucose.

dria is a family trend and occurs in increasing frequency after the forty-fifth year so that over half the people at sixty-five lack acid. It is a useful digestive medical adjunct wherever simple diarrhea is present or the patient has small stools soon after eating. Multiple avitaminoses are likely concurrent and roentgen inspection with barium shows rapid progression through the small intestine. Is this an evidence of sluggish absorption? Is it not likely that the relatively small amount of hydrochloric acid given acts especially by keeping the pylorus closed and emptying the stomach gradually as nature intended?

(e) *The native and inherent food qualities are dependent upon the soil.*—It is too often implied that common articles of food are uniform in nutritive and mineral content. Albrecht[1,2,3] and other agronomists have thoroughly exploded that fallacy. Living in a richly endowed agricultural area the questions of soil exhaustion, erosion and degeneration in the quality of foods for man and domestic animals (the great concentrators) have received little consideration. Some soils are very young—geologically speaking. General impoverishment, widespread deficiencies and disease abound or some natural industry (mines, lumber, coal) must balance the deficit and make possible extensive importations from good soil areas. Where cattle are "runty" and hogs are razor-backed you have the best of evidence that people are living on "marginal soils." That is one reason why pioneers have maintained better stocks than their descendents. They took the fertility out of the soil in one or two generations; their progeny didn't put it back and, without the manure from domestic animals, artificial fertilizers entail expense and involved farming.

(f) *Food faddism* has had much discussion. Usually its devotees are considered to be among those with the various neuroses—digestive, cardiac, et cetera. There are few indeed to whom personal health is not a vital issue. In fact it easily becomes an obsession; and any suggestion that age is a ripening process and inevitable is not nearly as acceptable as the dictum, "Tell me what you eat and I will divulge to you not only what you are but your life span as well." The present rage of vitamin exploitation is as good an example as any; and much safer than the "uric acid" crusade of a half century ago that helped to give protein a black eye. In our saner moments we must agree that doctors have fathered most fads from catharsis and consumption cures to ulcer and high blood pressure diets. Presently, doctors are ordering train loads of concentrated vitamins exactly as a generation ago they ordered digestants and bitter tonics. Sarsaparilla compounds, Peruna and Lydia Pinkham's feminine cordial flowered then exactly as Betrex showers the populace via the air channels. Any analysis of food faddism leads immediately to a consideration of the largest group of our population presently receiving the least worthy medical attention —the psychoneurotics. Yaskin[16] has recently outlined this field of gastrointestinal disorders in a masterful fashion. Unfortunately few surgeons will read or understand his thesis and for too long Walter Alvarez has been a voice calling in the wilderness. There is no better way to help psychoneurotic folk than to feed them wisely and well.

The tendency to multiple deficiencies agglomerates with age. Needless to say life complexities do also. Therefore good geriatric technique demands that organic structure be capably inventoried—at the same time walking museums of pathology (ulcer scars, hypertensive hearts, concreted arteries, stone deposits here and there) carry on with good minds and brilliant personalities. Much medical thought should be given to preparing the aged to meet the afflictions that are inevitably to be theirs.

7. Geriatric practice and hospitalization.

(a) For this symposium Norman[9] has shown what a complicated hospital problem arises in the situation where the life span is extended and a large dependent group arrives at permanent invalidism. Small hospitals cannot serve their communities in the matter of acute remediable disorders and allow their bed capacities to be overtaxed with hopeless cancer and the sequelæ of cardiovascular disease (the cause of 60 to 65 per cent of deaths in those over fifty years of age).

Large public hospitals similarly come to a situation where the type of modern alert nursing, intern and laboratory service should be keyed up to give the greatest possible service in the least possible hospital day's residence.

(b) This fits in with the tables and discussion likewise presented in this symposium by Clagett.[7] When Clagett's tables are studied it is obvious that every aged person faces the likelihood that

some major operation may be needed either as an emergency or as an elective choice. Emergency operations carry a high mortality; naturally it comes to mind that neglected appendicitis or gut strangulation offer the types with vicious trends. At the same time the imminent disaster impending does not permit the nutritional build up (as for instance Wangensteen insists upon in gastrointestinal cancer) that so often determines successful elective surgery even of the severest grades.

(c) Therefore hospitals should gradually come to tie up their laboratories with the nutritional status of their patients. Recent reports from various hospitals[12] reflect this tendency.[8,13] Fundamentally is the patient in nitrogen balance? Whether it be severe burns and shock, cancer of the pylorus, ulcerative colitis or hemoglobin deficiency, the laboratory problem is not simply to yield up a name for a disease but to estimate the current needs of the patient struggling to maintain physiological balance. So the blood bank and plasma center, the parenteral amino acids and every other development must work in unison. If this is done and physiological balance is maintained, age alone is no deterrent to any necessary operation.

Summary

1. Geriatrics is a medical division in which all doctors must develop an interest. The growing of the aged may need at any time involved medical, surgical and hospital care.

2. The word "timing" now used in planning military exploits—a combination of forces to attain an objective—fits well into this medical problem.

3. The problem of human nutrition is of world wide interest and is uppermost in the minds of all who plan and hope for peace.

4. Each doctor must satisfy himself with his own experience and reading that the nutrition of his patient (whatever the organ deficit or disease existing) deserves his individual guidance.

5. Among the aged the medical adviser must take comfort and advantage in becoming less of a healer than an umpire and guide.

References

1. Albrecht, Wm. A., and Smith, G. E.: Biological assays of soil fertility. Proc. Soil Sci. Soc. America., 6:252, 1941.
2. Albrecht, W. A.: Sound horses are bred on fertile soils. Percheron News, p. 15, (July) 1942.
3. Albrecht, Wm. A., and Smith, G. E.: Feed efficiency in terms of biological assays of soil treatments. Proc. Soil Sci. Soc. America, 7:322, 1942.
4. Boyd, J. D.: Nutrition as it affects tooth decay. J. Am. Dietet. A., 18:211-215, (Apr.) 1942.
5. Cannon, W. B.: Body physiologic and body politics. Science, 93:1-10, (Jan. 3) 1941.
6. Carlson, A. J.: Challenge of unused human resources. J. Am. Dietet. A., 18:647-651, (Oct.) 1942; *also* What is wrong with American diet? Northwest Med., 41:334-337, (Oct.) 1942.
7. Clagett, O. Theron: Surgical treatment of the aged. Minnesota Med., 28:884, (Oct.) 1943.
8. Messinger, William J.: Nitrogen equilibrium and regeneration of serum protein following intravenous use of amino acids. Arch. Int. Med., 72:91, (July) 1943.
9. Norman, J. F.: General care of the aged. Minnesota Med., 28:876, (Oct.) 1943.
10. Peters, John P.: A new frame for metabolism. Am. Scientist (The Sigma Xi Quarterly), 31:37, (Jan.) 1943.
11. Price, Weston, A.: Nutrition and Physical Degeneration. New York: Paul B. Hoeber, Inc., 1939.
12. Tuohy, E. L.: Gout—a forgotten disease. Minnesota Med., 24:215, (Apr.) 1941.
13. Tuohy, E. L.: Providing for the nutritional needs of the older hospital patients in general hospitals. (Submitted for publication to American Hospital Journal.)
14. Tuohy, E. L.: Feeding the aged. J.A.M.A., 121:42, (Jan.) 1943. (This article will constitute a chapter in a book, Handbook of Nutrition, soon to be published by the A.M.A.)
15. Wangensteen, O. H.: Personal communication and visit to his clinic.
16. Yaskin, Joseph C.: The treatment of functional gastrointestinal disturbances of neuropsychiatric origin. Ann. Int. Med., 18:949, (June) 1943.

SURGICAL TREATMENT OF THE AGED

O. THERON CLAGETT, M.D
Rochester, Minnesota

WHEREAS in 1850 only 2.6 per cent of the population of the United States were more than sixty-five years of age, in 1931, 5.4 per cent exceeded that age. It is conservatively estimated that, if the present trend continues, in the next forty years 40 per cent of the population of this country will be more than forty-five years of age and that about 15 per cent will be more than sixty-five years of age. Between 1930 and 1940, the number of Americans more than sixty-five years old increased 35 per cent, from 6,633,805 to 8,956,206, while the total population gained only 7.2 per cent. It is already becoming apparent that this remarkable trend of the population toward older ages is having considerable influence on the practice of medicine and surgery. Patients of advanced age even now represent an

From the Division of Surgery, The Mayo Clinic, Rochester, Minnesota.
Read at the annual meeting of the Minnesota State Medical Association, Minneapolis, May 17, 1943.

important proportion of the practice of medicine and surgery. In the future, as more and more individuals live longer, diseases will afflict them which will require at least that surgical treatment be considered.

Chronologic and Physiologic Age

In considering old age from the surgical standpoint, it must be remembered that chronologic age, measured in years, is not the same as physiologic age. No person's body is of the same physiologic age in all its parts, for different structures and different systems of the same person age at different rates at various times. Few individuals reach advanced age without some part of their physiologic mechanism having sustained appreciable damage. It may be the heart, kidneys, lungs or liver, the vascular system or the gastro-intestinal tract, or any combination of these, that is chiefly affected. James Paget well expressed the distinction between chronologic and physiologic age when he said, "Years, indeed, taken alone are a very fallacious mode of reckoning age: it is not the time but the quantity of a man's life that we have to reckon . . . the old people that are thin and dry and tough, clear voiced and bright eyed, with good stomachs and strong wills, muscular and active are not bad; they bear all but the largest operations very well. But very bad are they who, looking somewhat like these, are feeble and soft skinned, with little pulses, bad appetites and weak digestive powers so that they cannot, in an emergency, be well nourished."

An arbitrarily established chronologic age.— But, for practical purposes at what chronologic age must patients be classified as old? Reports in the literature place the lower limit of old age all the way from fifty to eighty years. As has just been said, it is the physiologic rather than the chronologic age that is of real importance. Nevertheless, until some means of expressing physiologic age is devised, some chronologic age must be selected as the beginning of old age in studies such as this. Many authors have selected seventy years as the proper point, basing their decision on the biblical life span of three score years and ten. It would seem that if three score years and ten is to be considered the normal length of life, the last few years of that period may justifiably be called old age. In this review, then, sixty-five years has been selected as the lower limit of old age because the majority of individuals of that age, and more than that, are physiologically old, at least to some degree. If this view is accepted, discussion of selection of patients for operation can begin.

Selection of Patients

We physicians are not justified in dismissing a patient with the facile judgment, "too old for surgery." The excellent reviews of large numbers of operations on old people, published by Bailey, Brooks, Rankin and Johnston, Thompson and Habein, Quigley, Dulin and Hay, as well as reports of smaller numbers of cases by Mayo and Nettrour and many other writers, refute any belief that age in itself is ever a contraindication to almost any surgical procedure. Unless thorough study indicates that the risks of surgical measures are prohibitive, or that the condition can be satisfactorily treated by some more conservative method, the patient should be offered the benefits of surgical treatment regardless of chronologic age. As Brooks has said, "The half million old men and women of 1850 could be told that they were too old to be operated on, but in 1950 the twelve and one-half millions of corresponding ages will consider themselves too young to be so carelessly dealt with." It has been my experience, moreover, that an old person suffering from a condition for which surgical relief is possible, instead of fearing the outcome because of his age, usually is a much more willing candidate for operation than his younger fellow sufferer.

Nevertheless, whether or not to advise operation on many patients in the age group that is under consideration frequently is difficult to determine. In addition to consideration of the immediate operative risk, it is necessary to decide whether or not some condition other than that for which operation is contemplated will end this patient's life before he can receive benefit from the proposed operation. Purely palliative operations are justifiable, even in the face of great risks, because relief of discomfort and pain, even for only a few months, often is of more importance to old people than cure of the underlying trouble. Although these principles of selection find their broadest application to patients suffering from malignant disease, they apply to those suffering from benign conditions as well. However, since imminent death is not a factor

to be considered in the presence of benign conditions as a rule, patients who have benign conditions and who constitute bad risks, may be denied operation if symptomatic relief can be given in any other way. Nevertheless, it should be remembered that life may be almost as miserable to an old man with a huge hernia which no truss will hold, or to an elderly woman with complete procidentia, as to the patient with malignant obstruction of the pylorus. The criteria just expressed and implied for selection of patients will result in a much higher rate of operative morbidity and mortality than if operation is offered only to patients who are in good general condition and are free from coincident serious disease. But the probability of resultant high morbidity and mortality should not deter the surgeon when intolerable life, or certain death, are the only alternatives to operative intervention.

Irrespective of the desire of the patient for operation, and the willingness of the surgeon to operate, evaluation of the physiologic and psychologic status of the organism as a whole is necessary before an accurate opinion can be given regarding the proper therapeutic procedures. Each system and organ must be thoroughly studied and evaluated and, if necessary, rehabilitated to the best possible state, so that it will not fail in some crisis. Particularly important in working with old people are investigations of the respiratory, cardiovascular and urinary systems. In addition to physical examination, urinalysis, leukocyte count, determination of hemoglobin, a roentgenogram of the thorax and estimation of the concentration of urea or nonprotein nitrogen in the blood should be made in all cases, unless conditions contraindicate any delay. Further laboratory studies should depend on the indication suggested by the history or physical examination.

Pre-operative Preparation

When all the data are in, and decision has been made, pre-operative preparations can begin. It should proceed along much the same lines as that for younger patients. Concomitant diseases should be brought under control; for instance, diabetes and cardiac failure. In this regard, if a patient is suffering from prostatic obstruction, probably it is advisable to relieve the condition surgically before embarking on other surgical ventures. Before operation particular emphasis should be placed on bringing to their optimum the state of nutrition, the water balance and chemical balance. Old persons often do not eat properly; hence, many suffer from mild but definite vitamin and nutritional deficiency.

Many writers have stated that elderly and old patients are considerably upset by change in their customary modes of existence. Such authors have advised hospitalization for several days before operation to allow adjustment to the new routine. However, in my experience these patients have adjusted to the changed environment just as easily as, if not more easily than, younger patients. They have a philosophic attitude toward life that permits them to accept the whole procedure with more tranquility than most younger individuals. However, any unnecessary restrictions should be avoided and lifelong habits, such as smoking or the moderate use of alcohol, should not be broken without valid reason.

A word should be said in regard to the preoperative use of sedative and narcotic drugs. Old patients as a group react quickly and with maximal response to such drugs. Hence, they should be administered in small doses only.

Anesthesia

Surgeons disagree as to what is the best means of anesthesia for operations on old people, and most surgeons seem to have rather strong ideas on the subject. It is probable, as Rankin and Johnston have pointed out, that the means of anesthesia is not so important as having a skilled anesthetist in charge. Several anesthetic agents, and several methods of administration, were used in the group of cases that is to be considered in a moment.

Postoperative Care

The principles of postoperative care are no different for patients of this age than for those of other ages but particular attention to detail is necessary since old patients lack the reserve of younger patients. Several matters are particularly important. Surgeons and nurses should insist on early and frequent change of position, active motion of the extremities and deep breathing. Hourly, or more often during the first twenty-four to forty-eight hours, carbon dioxide should be administered by inhalation. Sedative and narcotic preparations should be given cautiously. Fortunately these patients stand postoperative pain well, and small, infrequent doses

are all that are usually required. While fluid in quantity adequate to insure a urinary output of about 1 liter a day should be given, if fluids are administered intravenously at all, they should be given much more slowly than is necessary in giving them to younger patients, who possess much more resilient cardiovascular systems.

TABLE I. MAJOR OPERATIONS ON PATIENTS SIXTY-FIVE YEARS OF AGE OR MORE
1939 and 1940

Age, years	Patients	Operations	Hospital Deaths	
			No.	Per Cent of Operations
65–69	756	850	67	8
70–74	337*	391	32	8
75–79	92	101	13	13
80–84	18	19	7	37
85–89	3	3	1	33
Total	1204	1364	120	9

*Two patients in this group also are included in the previous age group; therefore they are counted only once in the total.

Although not all surgeons agree, most of them do feel that to get these patients up, at least to the extent of sitting on the edge of the bed, within a day or two after operation, greatly reduces the chances of development of pulmonary complications. Although healing of wounds may be slowed by so doing, risk of serious trouble on that score is slight compared to the advantages gained. Laplace and Nicolson have shown that inactivity of old patients confined to bed leads to circulatory retardation and peripheral stagnation, conditions which are closely analogous to shock. These investigators demonstrated, also, that local anoxemia and consequent degeneration of tissues due to peripheral stagnation lead to toxemia and to permanent capillary damage which perpetuates the circulatory fault and may ultimately end in death. These findings favor as short a period of rest in bed as possible. Whenever it is feasible, I encourage elderly patients to be up and about pre-operatively as well as postoperatively. I have been favorably impressed by the benefits to be gained by getting these patients moving about early.

TABLE II. EMERGENCY OPERATIONS ON PATIENTS SIXTY-FIVE YEARS OF AGE OR MORE
1939 and 1940

Type of Operation	Operations	Hospital Deaths	
		No.	Per Cent
Repair of incarcerated or strangulated hernia	13*	4*	31
Appendectomy (including one drainage)	10*	2*	20
Enterostomy, cecostomy, or colostomy for intestinal obstruction	7	5	71
Cholecystostomy	3	2	
Resection of gangrenous ileum	4†	3†	
Closure of perforated duodenal ulcer	3	0	
Other operations	4	1	
Total	43	16	37

*In one case listed in both groups, hernia was repaired and one appendical abscess was drained.
†In two cases of strangulated hernia, repair was not done. One of these patients died.

I have never seen harm come from it and I am sure it has improved the general condition of the patients.

Survey of Cases

Recently I reviewed the records of 1,204 patients sixty-five years of age or older who underwent one or more major operations, at the hands of general surgeons of the Mayo Clinic during the years 1939 and 1940. This series does not include operations done in the special fields of neurosurgery, orthopedic surgery, proctology, ophthalmology, otorhinolaryngology, plastic surgery or transurethral surgery. It should be stated, however, that a considerable number of the patients under consideration were subjected to major surgical procedures during 1939 and 1940, in one or another of the named special fields, as well as to the major operations with which this paper is concerned.

As is evident in Table I, 1,204 patients underwent 1,364 separate operations, or rather separate operative sessions. The operations included procedures performed in two stages, such as colostomy followed by combined abdominoperineal resections, as well as multiple operations on one patient for conditions entirely unrelated to one

TABLE III. OPERATIONS FOR BENIGN DISEASE ON PATIENTS SIXTY-FIVE YEARS OF AGE OR MORE 1939 and 1940

Type of Operation	Operations	Hospital Deaths	
		No.	Per Cent
Gall bladder and ducts	197	16	8
Thyroid gland	114	9	8
Hernia (exclusive of diaphragmatic hernia)	92	4	4
Stomach	76	4	5
Kidneys, ureters and bladder	37	3	8
Colon	23	3	13
Appendix (not incidental)	19	4	21
Female pelvis	60	1	2
Other operations	51	3	6
Total	649*	45*	7

*In a few cases operations were performed on different organs at the same time; these are included only once in the totals.

TABLE IV. OPERATIONS FOR MALIGNANT DISEASE ON PATIENTS SIXTY-FIVE YEARS OF AGE OR MORE 1939-1940

Site of Lesion or Procedure	Operable Lesions			Inoperable Lesions		
	Operations	Hospital Deaths		Operations	Hospital Deaths	
		No.	%		No.	%
Colon and rectum	277	29	10	83	13	16
Breast	77	1	1	23	1	4
Stomach	63	7	11	75	9	12
Gall bladder, ducts and pancreas	2	0		35	10	29
Kidneys, ureters and bladder	19	1	5	0	0	
Neck	18	1	6	0	0	
Thyroid	6	0		1	1	100
Female pelvis	10	0		12	3	25
Miscellaneous operations	7	1	14	12	1	8
Total	479	39*	8	241	38	16

*In one case in which death occurred two operations were performed. The death is counted only once in the total.

another. Each stage of one operation and each operation of multiple operations are counted as one procedure.

Only forthy-three emergency procedures were performed in this series (Table II) but the mortality rate was 37 per cent, as compared with a mortality rate of 9 per cent for the entire group. This emphasizes the risks of emergency surgical procedures on patients of advanced years. More important than that, however, Table II suggests what could be accomplished if prophylactic surgery was carried out for some conditions. For instance, the mortality of 31 per cent for emergency operations for hernia can be compared with a mortality (not shown in the table) of zero for seventy-nine elective operations for hernia in the same age group.

Of the operations for benign conditions of the thyroid gland (Table III) fifteen were for exophthalmic goiter, eighty for adenomatous goiter with hyperthyroidism and nineteen for adenomatous goiter without hyperthyroidism. All nine deaths occurred following operations for adenomatous goiter with hyperthyroidism. This experience emphasizes the fact that those who have adenomatous goiter with hyperthyroidism should be urged to undergo surgical treatment for the condition before complications have developed. Under "stomach" operations are grouped benign, gastric and duodenal ulcer. The fifty-one "other operations" represent repair of diaphragmatic hernia (nine cases without a death), splenectomy, simple mastectomy for benign disease, and so forth.

It is of value to compare the incidence and mortality of surgical procedures for benign disease with the incidence and mortality of surgical procedures for malignant disease. In this series, 649 operations were performed for benign disease, with a mortality rate of 7 per cent (Table III) For operable malignant lesions 479 operations were performed with a mortality of 8 per cent (Table IV) and for inoperable malignant lesions, 241 exploratory or palliative operations, with a mortality of 16 per cent. Table IV, in which are recorded operations for malignant disease, does not require further comment except to say that under "inoperable" lesions are included all palliative operations as well as explorations.

That women tolerate surgical operations much better than men is well known. The operations listed in Table V were chosen for presentation

TABLE V. NUMBER OF MALE AND FEMALE PATIENTS, SIXTY-FIVE YEARS OF AGE OR MORE, SUBJECTED TO CERTAIN MAJOR OPERATIONS
1939 and 1940

Operation	Men			Women		
		Hospital Deaths			Hospital Deaths	
	No.	No.	%	No.	No.	%
On gall bladder and ducts (benign lesion)	96	13	14	101	3	3
Thyroidectomy (benign lesion)	32	3	9	82	6	7
Repair of hernia (except diaphragmatic)	75	4	5	17	0	0
For malignant lesion of stomach	109	14	13	28	2	7

because they are examples of procedure to which members of both sexes are likely to be subjected.

Complications that occur following surgical operations on patients of advanced age are, as would be expected, of a high incidence. In Table VI they are listed in the order of their frequency. Infections of the urinary tract are of frequent occurrence but usually are not significant. Generally they can be controlled easily by use of the chemotherapeutic agents. Recently I have been using sulfathiazole in doses of 2 grains four times a day as a prophylactic agent to prevent postoperative development of infections of the urinary tract. It has been extremely effective, particularly following pelvic operations and if catheterization is necessary.

Respiratory complications (Table VI) make up a high percentage of the complications and were the primary or contributing causes of death in fifty-three of the 120 cases in this series in which death occurred. I am hopeful that increased postoperative use of chemotherapeutic agents and of oxygen and carbon dioxide by inhalation as well as frequent changes of position and getting these patients out of bed early after operation, will materially reduce the seriousness of this complication.

Certain other complications have occurred in descending order of frequency (Table VI). Infection of wounds has been of common occurrence. This is understandable when it is considered that a high percentage of these operations were for malignant disease of the colon.

TABLE VI. POSTOPERATIVE COMPLICATIONS AMONG PATIENTS SIXTY-FIVE YEARS OF AGE OR MORE
1939 and 1940

Operations	1364
Complications occurred	472
Morbidity, per cent	34.6

Complication	Total	Primary or Contributing Cause of Death
Infection of urinary tract	145	2
Respiratory complication (except emboli)	131	53
Infection of wound	64	0
Peritonitis	35	28
Pulmonary embolus	30	20
Gastric retention	27	4
Cardiac disorders	26	10
Thrombophlebitis	26	1
Psychosis	15	0
Uremia	14	6
Hemorrhage	11	0
Cerebrovascular accident	9	5
Ileus or obstruction	9	5
Other complications	93	22

Chemotherapeutic agents used locally should materially decrease the incidence of this complication. Peritonitis should occur much less frequently in the future with the use of intraperitoneal chemotherapy. Practically all of the peritonitis occurred following operations on the colon. Pulmonary embolism is attended by high mortality. Recent developments should materially decrease the dangers of this complication. Heparin and coumarin have given encouraging results. Cardiac disorders represent a different group. The ability of the heart to carry through an operative procedure is extremely hard to estimate. I doubt if much can be done at present to eliminate this hazard. Thrombophlebitis occurred much less frequently than was to be expected among patients of the age concerned. Old patients present postoperative psychosis much more frequently than do younger patients, but this complication is not a factor in mortality.

The remaining complications listed are not remarkable. Those listed in Table VI as "other complications" includes: hiccup, erysipelas, parotitis, hepatic failure, leukopenia and so forth.

It is apparent that recent developments, particularly in the use of the chemotherapeutic drugs and anticoagulant agents, are going to play an increasingly important role in the postoperative care of patients of advanced age. These agents should materially decrease the postoperative morbidity and mortality among old people.

Summary

Surgical operation on individuals of advanced age is a problem of increasing importance in the United States because of the trend of the population toward older ages. Physiologic rather than chronologic age is of primary importance. Careful pre-operative examination and preparation are essential in order to restore the patient to the best possible condition. Preventive surgical procedures, that is, early operation for frankly progressive surgical disease, should be even more earnestly advocated for the old than for the young. Patients of advanced age can undergo surgical procedures with reasonable risk. Recent developments, chemotherapy, anticoagulant substances and so forth, will materially reduce present dangers.

STUDIES ON THE DIAGNOSIS AND TREATMENT OF EPIDEMIC AND EXPERIMENTAL POLIOMYELITIS WITH POLIOMYELITIS ANTI-STREPTOCOCCIC SERUM: SUMMARY OF RESULTS

EDWARD C. ROSENOW, M.D.
Rochester, Minnesota

REGARDLESS of the evidence which has been adduced indicating a causal relation of the streptococcus to poliomyelitis and to what is now considered virus,[3,5,10,11,12,15,17,23,24,25] certain requirements of proof of such relation have been lacking until recently; that is, the demonstration of microdiplococci in filtrates of virus[13,14,20] and the production of the classic clinical and pathologic picture of poliomyelitis in monkeys with virus derived from streptococci.[15,16,21] Now that these additional proofs have been obtained, a review of the development of the specific antiserum and a summary of the results obtained from its use in treatment of experimental and epidemic poliomyelitis are thought desirable.

Horses were first immunized in 1916 with freshly isolated strains of the living streptococcus of poliomyelitis obtained from human beings and, after the epidemic had subsided, with strains freshly isolated from time to time during the period of immunization (seven months) from the spinal cords of monkeys that had succumbed to experimental poliomyelitis after inoculation of virus.[7] At the end of the period of immunization the antiserum, in extremely high dilutions, was found to agglutinate specifically the poliomyelitic type of streptococcus. It protected rabbits against inoculations of the streptococcus and protected monkeys against inoculation of poliomyelitic virus. The need then and now for a curative serum such as this, which can be made available in any amount, was and still is especially great, because even if poliomyelitis convalescent serum were effective, it could not solve the problem since the disease would have to continue to occur with its dire consequences to assure a supply.

The first opportunity to use this immune serum in the treatment of patients occurred in 1917 during an epidemic of poliomyelitis in Davenport, Iowa, surrounding country and nearby towns. The results from its intravenous injection in the treatment of fifty-eight cases of poliomyelitis were most gratifying. The findings, the amount of serum administered and the effects noted in each case were reported in detail at that time.[8,9] It was truly great to see patient after patient respond to the injection of this newly developed antiserum. Physicians, whose patients were seen in consultation and treated in their homes with the serum, were as impressed as I was. Diagnosis was made on the clinical history, physical examination and characteristic

From the Division of Experimental Bacteriology, the Mayo Foundation, Rochester, Minnesota. Presented at the meeting of the Southern Minnesota Medical Association, September 28, 1942, Rochester, Minnesota.

findings on immediate examination of the cerebrospinal fluid at the bedside. The serum was administered as soon as the diagnosis was established. The disease in this epidemic was unusually severe. A high incidence of paralysis occurred. The mortality rate in an untreated group of twenty-three cases was 35 per cent. Of the fifty-eight patients receiving the serum, ten (17.2 per cent) died. Excluding seven of the fatal cases in which the patients were practically moribund at the time of the first serum treatment, there were three deaths (5.9 per cent) in fifty-one cases in which the serum possibly could have beneficial action. Paralysis did not develop in any of nineteen cases in which serum treatment was given before its onset and prompt recovery occurred in all. Extension of paralysis rarely occurred among patients who recovered and who had paralysis which was often far advanced at the time of the first serum treatment.

Patients in the early stages of the dreaded bulbar type of the disease with early difficulty in swallowing and breathing, patients having the ascending spinal type with almost complete flaccid paralysis of all extremities and with difficulty in breathing owing to involvement of the nerve centers of the muscles of respiration, and even patients in the early stages of partial or complete coma often responded favorably to administration of the serum, provided the serum was given soon after onset of such grave symptoms. There was often prompt disappearance or diminution of subjective symptoms, such as headache, pain in the affected extremity or extremities, restlessness and hyperesthesia or mental apathy; disappearance of twitchings or spasms of muscles; disappearance of nausea and vomiting, or of diarrhea; return to normal, or more nearly normal, of reflexes that had been absent, unequal, diminished or increased; lowering of the pulse rate; drop in temperature usually after an initial short rise; lessened rigidity of the neck or spinal column; no extension of progressive paralysis and improvement of muscle function.

In order to make more practical the preparation of the antiserum, a method for the preservation of specific antigenic or immunizing properties of the streptococcus throughout the period of immunization of horses was searched for. It was found that by placing the freshly isolated streptococci in dense suspensions in glycerol (2 parts) and 25 per cent solution of sodium chloride (1 part) and keeping these in the refrigerator, antigenic specificity was preserved almost indefinitely. All subsequent batches of antistreptococcic serum used for treatment were prepared by diluting these dense suspensions as needed for injections throughout the period of immunization. The experimental and clinical results obtained from the use of the antiserums prepared in this way have been comparable with those obtained in 1917.[18,19,22,25]

Most of the patients studied who had poliomyelitis were seen at home in consultation with the family physician and the serum was administered at once after the diagnosis was established by spinal puncture and immediate examination of the cerebrospinal fluid and not after the loss of precious time incident to hospitalization. The diagnostic skill of the family physician, as I have seen it, in recognizing the unusual in illnesses as they occur in family units and their promptness in instituting treatment, is truly commendable. The results reported to me by physicians, to whom the serum was sent and of those who reported results independently, were strikingly similar to those which I observed.[1,2,4,6,26,27] All who had opportunity to treat the disease early in a large number of cases reported enthusiastically on the results obtained.

The results summarized in Table I represent published and as yet unpublished reports. I have studied the effects of the serum in treatment in twenty different epidemics of poliomyelitis which have occurred since 1917 in different regions of the United States and in Cuba, in four institutional outbreaks and in many cases that occurred in isolated family groups. The two most important consequences of this disease, death and residual paralysis, were consistently lower, usually much lower, in the treated than in the control untreated cases that occurred in the same epidemics.

The mortality rate in the groups of patients receiving the serum in the early stages of the disease, before and soon after onset of paralysis, was reduced eightfold and fourfold, respectively, and the incidence of residual paralysis, about fifteenfold and tenfold, respectively. Even the patients who received the serum for the first time after severe paralysis had occurred fared better than did others who did not receive serum. Of the total of 2,664 patients who were treated with the serum, 252 (9.6 per cent) died,

which is in sharp contrast to 583 deaths (21.3 per cent) in 2,737 cases that occurred in the same epidemics but in which the serum was not used. The same procedures were used in the onset of suggestive symptoms, before penetration by the virus or streptococcus of the nerve centers in the spinal cord. Thus, it should be possible by therapeutic injections of a curative serum at

TABLE I. SUMMARY OF RESULTS FROM THE TREATMENT WITH POLIOMYELITIS ANTISTREPTOCOCCIC SERUM OF PATIENTS SUFFERING FROM ACUTE POLIOMYELITIS

Cases studied by	Condition of patient at time of first serum treatment	Cases	Deaths		Cases*	Severe residual paralysis	
			No.	Per Cent		No.	Per Cent
Rosenow and co-workers, and physicians to whom serum was sent on request	Before onset of paralysis	487	16	3.3	460	9	2.0
	After slight to moderate paralysis	696	42	6.0	621	20	3.2
	After severe paralysis	771	134	17.4	635	150	23.6
	Total	1,954	192	9.8	1,716	179	10.4
	Controls, patients not treated with serum, during the same epidemics	711	176	24.8	535	178	33.0
Other physicians, independently	Patients treated with poliomyelitis antistreptococcic serum	710	60	8.5			
	Controls, patients not treated with poliomyelitis antistreptococcic serum, in the same epidemics	2,026	407	20.1			
Total patients treated with poliomyelitis antistreptococcic serum		2,664	252	9.6			
Total control cases, patients not treated with poliomyelitis antistreptococcic serum		2,737	583	21.3			

*This group consists of those cases in which data as to end results were obtained.

diagnosis of the two groups of patients and while minor errors, no doubt, were made in some instances in estimating the clinical results, there can be no doubt of the essential accuracy of the final outcome with regard to death and residual paralysis.

The findings on examination of cerebrospinal fluid, while of great value in the diagnosis of poliomyelitis, are not always sufficiently characteristic to distinguish poliomyelitis from certain forms of encephalitis and tuberculous meningitis. Moreover, changes from the normal in cerebrospinal fluid do not occur until after penetration of the virus or streptococci into the central nervous system. The need was, therefore, great for a means of determining the type of infection at the the onset of symptoms to prevent paralysis and death.

In the course of my studies the euglobulin fraction of the poliomyelitis antistreptococcic serum was found diagnostic when employed in a cutaneous test. It was found that intradermal injection of approximately 0.05 c.c. of a 10 per cent solution, in physiologic saline solution, of the euglobulin fraction of the antistreptococcic serum prepared in horses elicited an immediate (ten minutes) erythematous and edematous reaction during the acute stage of poliomyelitis. An erythematous reaction to the poliomyelitis antistreptococcus euglobulin of 2 cm. or more in diameter or approximately 3 sq. cm. or more in area, no reaction or a smaller reaction to other

antistreptococcic euglobulins and no reaction to normal horse serum diluted 1:10 are considered diagnostic of "poliomyelitic" infection, and indicate that therapeutic injections of the serum should be given at once. However, the serum should not be given to contacts and noncontacts in epidemic zones, even though there may be a positive cutaneous reaction to the poliomyelitis euglobulin, unless fever and other symptoms suggestive of poliomyelitis are at hand.

A summary of the results obtained from intradermal injection of the poliomyelitis and influenza euglobulins in cases of acute poliomyelitis and of respiratory infections resembling influenza, and in groups of well and ill persons within and remote from epidemics of poliomyelitis and in-

TABLE II. A CUTANEOUS REACTION DIAGNOSTIC OF EPIDEMIC POLIOMYELITIS
Results from 1938 to 1941

Groups of persons tested	Cutaneous reactions* to the euglobulin of antiserums prepared with streptococci from:						
	Poliomyelitis		Influenza				
	Persons tested	%, 5 sq. cm. or more	Persons tested	%, 5 sq. cm. or more	Encephalitis	Ulcerative colitis	Arthritis
Poliomyelitis Acute, 1 to 14 days	324†	**92**	53†	11	202†	53	139
	9.48		3.2		3.4	2.0	2.7
Acute (spinal type)	17	**100**			17		
	8.81				3.0		
Acute (bulbar type)	11	**82**			11		
	8.15				7.0		
Abortive, 1 to 14 days	46	**85**			28		
	7.81				4.0		
Convalescent, 15 to 42 days	83	**42**			75		61
	7.42				2.3		2.0
Recovered	17	**18**					17
	2.54						2.8
Contacts	283	**54**	81	9	90	27	283
	6.82		1.57		1.8	1.5	1.5
Noncontacts, well persons and those sick with other diseases. Within epidemic zone of poliomyelitis	408	**51**	209	6	110	12	86
	5.24		2.11		1.3	1.8	3.2
Remote from epidemic zone of poliomyelitis and influenza	429	**13**	191	13	124	94	87
	1.82		2.76		1.0	1.3	2.0
Epidemic colds and influenza	46	**9**	62	**79**	37	13	45
	1.76		9.2		2.2	2.0	2.3

*Reactions to the control normal horse serum averaged less than 1 sq. cm. and in nonsensitive persons were never 5 sq. cm.

†The figures above the line in each instance indicate the number of persons tested; the figures below the line indicate the average reaction in square centimeters.

TABLE III. RESULTS OF IMMUNIZATION AND TREATMENT OF MONKEYS AND NEUTRALIZATION OF VIRUS

Groups of Monkeys		Monkeys	Deaths from poliomyelitis	
			No.	Per Cent
Inoculated with virus after immunization with the streptococcus		92	24	**26.1**
Normal controls inoculated with virus		57	48	84.2
Ill with experimental poliomyelitis, treated with	Poliomyelitis antistreptococcic serum	99	46	**46.5**
	Normal horse serum	86	71	82.6
Inoculated with virus	Treated with immune horse serum	56	15	**26.8**
	Treated with normal horse serum	33	26	78.8
	Untreated	70	56	80.0

fluenza, is given in Table II. Striking evidence of the diagnostic value of the cutaneous tests was obtained. Thus 298 (92 per cent) of 324 persons in the acute stage of epidemic poliomyelitis gave a reaction 5 sq. cm. or more in area to the poliomyelitis euglobulin and only 11 per cent of fifty-three reacted to the influenza euglobulin. In sharp contrast 79 per cent of sixty-two persons in the acute stage of colds or influenza reacted similarly to the influenza euglobulin and only 9 per cent of forty-six persons reacted to the poliomyelitis euglobulin. Similar results have been obtained independently by others.

In addition to a drop in temperature and pulse rate other objective evidence of the beneficial action of the antistreptococcic serum in treatment of persons and monkeys having poliomyelitis has not been lacking. Poliomyelitic streptococcal antigen, demonstrable in the skin of persons during attacks of poliomyelitis by intradermal injection of the euglobulin fraction of the antistreptococcic serum and in the blood serum by precipitation tests with the whole antistreptococcic serum, disappears promptly following therapeutic injection of the antistreptococcic serum.

The protection of monkeys by immunization with different strains of streptococci and corresponding vaccine and the curative and neutralizing action of different batches of the poliomyelitis antistreptococcic serum in a large number of experiments are well illustrated in Table III.

The results from the therapeutic use of the serum for human beings and monkeys, reported on from time to time in the medical literature, would have led, it is believed, to the general adoption of this specific serum treatment of poliomyelitis if the inciting agent had not been shown to be filtrable and if all requirements showing causal relation of the streptococcus to the virus could then have been fulfilled. Now that microdiplococci have been demonstrated in filtrates of the virus[20] and the classic picture of the disease has been produced in monkeys with virus derived from the streptococcus, and the diagnostic and preventive action of the serum have again been demonstrated, all objections to the general adoption of this method of treatment have been removed.

The serum for the diagnostic test and for treatment now is available commercially.

It is hoped that the methods and concepts that have led to these results, or that better ones along similar lines, will be generally adopted in order that the ravages of this dread disease, poliomyelitis, may soon be brought under control.

References

1. Clarke, Floyd, and Dow, A. G.: Rosenow's serum in prevention of paralysis in anterior poliomyelitis. J.A.M.A., 83:421-423, (Aug. 9) 1924.
2. Clarke, F. B.: Poliomyelitis, with especial reference to treatment with Rosenow's serum. California & West. Med., 22:437-441, (Sept.) 1924.
3. Mathers, George: Some bacteriologic observations on epidemic poliomyelitis. J.A.M.A., 67:1019, (Sept. 30) 1916.
4. Moody, Ellsworth, and Hesselberg, Cora: Poliomyelitis antistreptococcic serum; end results in a small epidemic. Arch. Pediat., 51:11-22, (Jan.) 1934.
5. Nuzum, J. W., and Herzog, Maximilian: Experimental studies in the etiology of acute epidemic poliomyelitis. J.A.M.A., 67:1205-1208, (Oct. 21) 1916.
6. Nuzum, J. W., and Willy, R. G.: Specific serum therapy of epidemic poliomyelitis. A report on one hundred and fifty-nine cases treated with antipoliomyelitic horse serum. J.A.M.A., 69:1247-1254, (Oct. 13) 1917.
7. Rosenow, E. C.: The production of an antipoliomyelitis serum in horses, by inoculation of the pleomorphic streptococcus from poliomyelitis. J.A.M.A., 69:261-265, (July 28) 1917.
8. Rosenow, E. C.: The treatment of epidemic poliomyelitis with immune horse serum. Preliminary report. J.A.M.A., 69:1074-1075, (Sept. 29) 1917.
9. Rosenow, E. C.: Report on the treatment of fifty-eight cases of epidemic poliomyelitis with immune horse serum. J. Infect. Dis., 22:379-426. 1918.
10. Rosenow, E. C.: Streptococci in the spinal fluid of experimental poliomyelitis in monkeys. J. Bact., 19:27-28, (Jan.) 1930.
11. Rosenow, E. C.: Poliomyelitis antistreptococcus serum; further studies on the bacteriology and serum treatment of poliomyelitis. J.A.M.A., 94:777-783, (Mar. 15) 1930.
12. Rosenow, E. C.: An institutional outbreak of poliomyelitis apparently due to a streptococcus in milk. J. Infect. Dis., 50:377-425, 1932.
13. Rosenow, E. C.: Observations on filter-passing forms of Eberthella typhi (Bacillus typhosus) and of the streptococcus from poliomyelitis. Proc. Staff Meet., Mayo Clin., 7:408-413, (July 13) 1932.
14. Rosenow, E. C.: A method of staining micro-organisms and

their capsular substance, and its application to streptococci and to filtrates of the viruses and spinal fluids in poliomyelitis and encephalitis. Proc. Staff Meet., Mayo Clin., 10: 115-121, (Feb. 20) 1935.
15. Rosenow, E. C.: The relation of streptococci to the viruses of poliomyelitis and encephalitis; preliminary report. Proc. Staff Meet., Mayo Clin., 10:410-414, (June 26) 1935.
16. Rosenow, E. C.: Further studies on the relationship of streptococci to the viruses of encephalitis and poliomyelitis. J. Bact., 33:61-62, (Jan.) 1937.
17. Rosenow, E. C.: Precipitin and cutaneous streptococcal ant body-antigen reactions in poliomyelitis. Proc. Staff Meet., Mayo Clin., 12: 531-535, (Aug. 25) 1937.
18. Rosenow, E. C.: The early diagnosis and treatment of poliomyelitis with poliomyelitis artistreptococcic serum. Illinois M. J., 75:144-149, (Aug.) 1939.
19. Rosenow, E. C.: Further results in the treatment of acute poliomyelitis with antistreptococcic serum (1928-1937). Minnesota Med., 23:161-164, (Mar.) 1940.
20. Rosenow, E. C.: Microdiplococci in filtrates of natural and experimental poliomyelitis virus compared under the electron and light microscopes. Proc. Staff Meet., Mayo Clin., 17: 99-106, (Feb. 18) 1942.
21. Rosenow, E. C.: Unpublished data.
22. Rosenow, E. C., and Nickel, A. C.: Treatment of acute poliomyelitis with poliomyelitis antistreptococcus serum; results from 1921-1925. Am. J. Dis. Child., 33:27-49, (Jan.) 1927.
23. Rosenow, E. C., and Wheeler, G. W.: The etiology of epidemic poliomyelitis. J. Infect. Dis., 22:281-312, 1918.
24. Rosenow, E. C., Heilman, F. R., and Pettet, C. H.: Observations on the epidemic of poloencephalitis in Los Angeles, 1934. Proc. Staff Meet., Mayo Clin., 9:443-451, (July 25) 1934.
25. Rosenow, E. C., South, Lillian H., and McCormack, A. T.: Bacteriologic and serologic studies in the epidemic of poliomyelitis in Kentucky, 1935. Kentucky M. J., 35:437-446, (Sept.) 1937.
26. Rowan, J. J., Jr.: Serum treatment of epidemic poliomyelitis occurring in Dubuque, Iowa, during the summer of 1918. M. Rec., 96:972-974, (Dec. 13) 1919.
27. Sugg, H. R.: Report on thirty-seven cases of acute poliomyelitis treated with Rosenow's serum. J. Iowa State M. Soc., 15:573-576, (Nov. 10) 1925.

WHEN THIRSTY—DRINK!

"When you are thirsty—Drink!" That is the advice of scientists who have been conducting intensive research into the water needs and habits of men stationed in desert climates such as at the Army Air Base in the Mojave desert, Blythe, California.

For weeks these scientists, working for the Office of Scientific Research and Development and under the sponsorship of the Quartermaster General's Department, have been making tests with a selected group of men to determine how much water a man stationed in the desert should drink and how he should drink it. These tests supplement similar work conducted last summer with Army Ground Forces.

Many old fallacies have been disproved and facts have been recorded by Dr. Edward F. Adolph and six associates from the University of Rochester.

"We measure the amounts of sweat lost from a man by his loss of body weight," Dr. Adolph said. "We find that a man who stops drinking water sweats about as fast as one who continues to drink what he wants. For a few hours, the non-drinker uses some of his body water to make sweat without missing it much. But thereafter he becomes exhausted if any more water is withdrawn from his body. Moreover, to feel comfortable again, he later has to drink the same quantity of water that he would have taken if he had not run into deficit. All the evidence known at present shows that a man cannot do without water, nor be trained to get along with less water.

"A man may fool himself unawares. He may get his water as pop at the PX instead of out of the water cooler or canteen. He may go to sleep and so need less water through less bodily exertion and exposure. He may contrive to work in the cool night instead of in the hot daytime. In such circumstances he might poohpooh the idea of a man needing more than a gallon a day. But the man who works in the sun needs two or three gallons in twenty-four hours in summer, and by no known method can he continuously get along on less.

"Water requirements of average men depend on their activity and on the daily temperature. Our measurements show that on days with maximum temperatures of 95 degrees Fahrenheit, a man must drink at least three quarts of fluid each day and one who works hard in the sun requires as much as seven quarts. On days when the temperature reaches 110 degrees, even the most inactive man (unless he is in an air-conditioned building) must have six quarts of fluid to drink; and men doing strenuous work in the sun require ten to twelve quarts each twenty-four hours.

"Early in June two squads of enlisted men and the laboratory personnel tested the ability of men to walk through the desert on one canteen of water per man. Both squads had their last water at 7:30 o'clock. One squad, walking only at night, made over twenty miles. The other squad, resting at night and walking from 10:30 o'clock, could make only eight and one-half miles. Both squads lost nearly the same amount of water in sweat and therefore suffered the same dehydration, but the night walkers were able to make two and one-half times the distance covered by the day walkers in the same time. This illustrates the advantage of doing work in the coolest part of the twenty-four hours whenever water is precious."—*Science News Letter,* September 25, 1943.

CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL

A. J. Hertzog, M.D., and S. V. Lofsness, M.D.
Pathologists

Presentation of a Case
A-43-1067

Dr. Lofsness: The case is that of a negro male, sixty-nine years of age, who was admitted to the Medical service on May 17, 1943, where he died on June 14, 1943.

For the last several years he had been employed as janitor in a local building, and had been in good health. He never had dyspepsia and his appetite was good until early April, 1943. At that time he developed marked anorexia, which persisted until his admission to the hospital. Associated with this, he lost about thirty pounds in weight and gradually became weaker. He stated that he had no pain whatsoever, and was able to work until May 10, 1943, when he collapsed to the floor and vomited a rather large amount of very dark liquid. During the last week before admission he remained at home, spending much of the time in bed because of weakness. He noted that his eyes became yellow and his stools black. He had urinary frequency but no dysuria, passing only small amounts of urine each time. During the 24 hours preceding admission he noted mild lumbar backache, and this was the first pain he had experienced during his illness. On May 17, 1943, he again collapsed and vomited a large amount of black liquid, so was brought to the hospital.

Examination showed him to be poorly nourished and his scleræ were deeply jaundiced. His temperature was 98 degrees, pulse rate 90, blood pressure 90/50. His pupils were moderately dilated, and did not react to light; they reacted slightly to accommodation. His heart did not appear to be enlarged and its rhythm was regular. There was a short systolic murmur at the apex. No abnormalities were found in the lungs. There was a large, firm, slightly tender, rounded mass in the suprapubic region which extended up to the umbilicus. His liver was palpable two centimeters below the right costal margin, but it was not tender. The extremities showed absent knee jerks, and positive great toe signs on the right.

Laboratory studies: Urinalysis showed a trace of albumin and a few red and white blood cells; hemoglobin 38 per cent (Sahli); RBC 2,030,000; color index 0.95; WBC 32,500 with 91 per cent neutrophiles; reticulocyte count 15 per cent; icterus index 100; Van den Bergh four plus direct and delayed direct; mean red cell diameter 8.8 microns; blood urea nitrogen 137.2 mg. per cent; creatinine 3.8 mg. per cent; plasma proteins 7.46 grams per cent. A blood smear showed marked macrocytosis, anisocytosis, and ten nucleated red cells per 100 leukocytes. Gastric analysis revealed 16 degrees of free acid. A stool specimen showed a large amount of occult blood, and only a trace of urobilinogen. There was a trace of urobilinogen in the urine.

Dr. Hertzog: We have an elderly negro with weight loss, jaundice, uremia, anemia, bleeding from the gastro-intestinal tract and a large tumor in the lower abdomen. One's first impression would be a gastro-intestinal malignancy that would act as a common denominator to explain everything.

Dr. Arthur: He was catheterized shortly after admission and the tumor disappeared. He had a urethral stricture and it was necessary to use a filiform catheter. We obtained 1800 c.c. of dark urine, with yellow foam. A retention catheter was inserted and his blood urea nitrogen fell to 32 mg. per cent in four days. His prostate was soft and not enlarged, so we felt that the retention was due to the stricture.

Intern: Is it dangerous to decompress the bladder suddenly by draining so much urine at one time?

Dr. Hertzog: The older urologists seemed to think so, but it is no longer generally accepted. Dr. Creevy tells me that after a careful search of the literature he was never able to find any statistics to show that it made any difference. May we see the x-ray films?

Dr. Stenstrom: A film of the chest shows an irregular prominence of the arch of the aorta, suggesting a small aneurysm. The stomach presents a very interesting picture. There is a deformity on the lesser curvature which is present in all films, consistent with the diagnosis of a benign gastric ulcer. In addition, the duodenal cap is markedly deformed. The second portion of the duodenum can not be visualized. Our diagnosis is an ulcer of the lesser curvature of the stomach that is probably benign. The duodenum was never well visualized.

Intern: We do not have any serologic tests to help in the diagnosis of syphilitic aneurysm of the arch of the aorta.

Dr. Lofsness: Serologic tests for syphilis are very unreliable in the presence of jaundice. In up to 20 per cent of cases, there is a false-positive reaction. In this case it might have been helpful to study the spinal fluid with regard to protein, cell count and gold curve.

The patient remained about the same for three weeks. He complained of no pain, and was able to be up in a wheel chair part of the time. He was given two blood transfusions and his hemoglobin remained between 40 and 50 per cent. His jaundice persisted, and repeated tests showed large amounts of blood in the stools—sometimes they were tarry. He remained afebrile but gradually became weaker; at no time did he complain of pain. He became stuporous two days before he died, and expired in coma.

DR. SCHLEICHER: Because of the macrocytic anemia, we studied the sternal marrow. There was myeloid hyperplasia. The erythrogenesis was hypoplastic with a moderate increase of the basophilic normoblasts. It did not suggest pernicious anemia. We studied the blood for sickling but this was not present. It did suggest a hemolytic anemia; macrocytosis is often observed in acquired hemolytic anemia.

DR. HERTZOG: Clinically, there was chronic blood loss and nitrogen retention that could be etiological factors in the anemia.

DR. PETIT: A liver biopsy was done. The picture was that of an obstructive jaundice with beginning biliary cirrhosis and many bile thrombi.

DR. LOFSNESS: A liver biopsy done with a long 15-gauge needle is a very valuable diagnostic procedure in the differentiation between the different types of jaundice. Unfortunately, the piece of tissue is so small that the pathologist cannot always make a definite diagnosis. Metastatic carcinoma can often be diagnosed but it is easily seen that the tumor nodules can be missed by the aspirating needle. Liver biopsies are particularly helpful in distinguishing between the so-called medical and surgical jaundice; i.e., whether the jaundice is due to an intrahepatic biliary block on the basis of primary liver disease or to an obstruction of the extra-hepatic biliary system. The laboratory distinction between these two types of jaundice is not easy and the findings are often equivocal. It is the liver biopsy in this case that makes us quite sure that we are dealing with an obstruction outside of the liver. We have not explained the nature of the painless obstruction. We know also that he has an ulcerated gastric lesion and a possible aneurysm of the aorta.

INTERN: The clinical expression was probable carcinoma of the head of the pancreas.

Autopsy Findings

DR. LOFNESS: The body was jaundiced and poorly nourished. On opening the abdomen, the gall bladder extended three centimeters below the edge of the liver. It was very distended, containing about 200 c.c. of dark bile. All the bile ducts were also greatly distended. There was a soft white tumor surrounding the ampulla of Vater, stenosing the duct. The tumor was up to two centimeters in diameter and elevated, but did not ulcerate the duodenal mucosa. However, there was an indurated, discrete ulcer on the lesser curvature of the stomach 2 cm. above the pylorus. This was 1 cm. in diameter and appeared benign. There was a similar ulcer, 1.5 cm. in diameter, on the posterior wall of the first portion of the duodenum. No eroded vessel was found in either ulcer, but it was felt that one of them was the source of the bleeding. Both kidneys showed hydronephrosis, and the ureters were dilated. Inasmuch as the prostate appeared normal, it was felt that the hydronephrosis was due to the urethral stricture. The liver weighed 1,500 grams. It was bile stained, but otherwise appeared normal. The abdomen was otherwise negative. The heart weighed 290 grams, and was normal except for mild coronary sclerosis. The root of the aorta showed a thickened, wrinkled intima, and there was a sacular aneurysm 5 cm. in diameter in the arch. The lungs appeared normal. No metastases were seen.

Microscopic Study: The tumor is a well differentiated adenocarcinoma. The liver shows the picture of obstructive jaundice of relatively short duration, with central lobular atrophy, bile thrombi and slight cirrhosis. The gastric ulcer is benign. The arch of the aorta shows a moderate number of lymphocytes in the media and adventitia, consistent with syphilis.

DR. HERTZOG: Carcinomas of the papilla of Vater are relatively rare. Baggenstoss in 1936 reported 28 cases from the autopsy records of the Mayo Clinic. The term "papilla of Vater" is preferable to "ampulla of Vater" as an ampulla is present in only about 50 per cent of persons. Due to their location, these tumors are capable of producing obstruction to the papilla when less than a centimeter in diameter. Hence, they are an example of one of the smallest tumors in the body producing the earliest symptoms. Unlike carcinomas of the bile ducts, the growths are usually well differentiated and metastasize relatively late. The distinction between polyps and early carcinomas in these cases is often arbitrary.

Anatomical Diagnosis: (1) Carcinoma of papilla of Vater; (2) jaundice; (3) gastric and duodenal ulcers; (4) urethral stricture; (5) bilateral hydronephrosis; (6) syphilitic aneurysm of aorta.

AVERAGE LENGTH OF LIFE INCREASES FOR WAGE EARNERS

The average length of life for American wage-earners increased by nine months during the first year of the war, reaching in 1942 the all-time high of 64.18 years, Metropolitan Life Insurance Company statisticians report on the basis of their industrial policyholders' experience.

Those in the nation who are middle-aged today, the figures further show, will live long enough to take a hand in building the postwar world and to see the many changes likely to come during the next quarter of a century.

"Under present mortality conditions, white men forty-five years of age and white women close to fifty still have a quarter of a century of life before them," the statisticians report.

The nine months increase in average length of life of the industrial worker during the first war year was not, of course, the result of the war. This and the gains of preceding years of longevity resulted from "our excellent medical and public health facilities, together with our rising standard of living."

A setback in longevity, the first since 1929, is predicted for the current year. Decrease in the supply of nurses and doctors for civilians, inability of public health services to expand as in the past, unsatisfactory living conditions around many centers of war industry, tightened living conditions for civilians and the mounting losses in the armed forces are expected to show up unfavorably in the mortality and longevity statistics at the close of 1943.—*Science News Letter,* September 25, 1943.

CASE REPORT

AGRANULOCYTOSIS ASSOCIATED WITH SULFADIAZINE THERAPY

EDMUND B. FLINK, M.D., AND THEODOR E. BRATRUD, M.D.

Minneapolis, Minnesota

SULFADIAZINE, in our experience, has been found to be a useful chemotherapeutic agent and provokes less toxic reactions than sulfanilamide, sulfapyridine or sulfathiazole. An infrequent type of reaction associated with sulfadiazine therapy is a decrease in the total leukocyte count from high or normal values to counts below 4,000 cells per cu. mm.[1,2] Agranulocytosis has been reported to have followed the use of sulfanilamide, sulfapyridine or sulfathiazole.[3,4,5,6] A review of the literature indicates that there is only a single case report of agranulocytosis being due to sulfadiazine.[7] The outcome of this reported case was not fatal. Therefore, it would appear that agranulocytosis is an extremely rare complication accompanying the use of sulfadiazine. The following case report is presented as an instance of acute agranulocytosis with a fatal outcome occurring during the course of treatment with sulfadiazine in a patient with subacute bacterial endocarditis. This patient represents the only fatal case of agranulocytosis that has been observed at the University Hospitals following the use of any of the sulfonamides.

Case Report

A white woman, aged twenty-eight was admitted to the University of Minnesota Hospitals on September 29, 1942. She had been in apparent good health until the preceding April, when a pleuritic type of pain occurred in the right side of the chest. At this time she was seven months pregnant. Shortly thereafter, she noted the onset of increasing weakness which was associated with night sweats, but no fever or chills. In June 1942, she delivered a normal female child after a short uneventful labor. Since then she had lost ten pounds in weight. About three weeks before entry to the hospital, a purpuric rash was noted on the lower extremities, and five days before admission, edema of the feet developed. Her past history revealed that at the age of fifteen she was told that she had a "leakage of the heart" and she was not permitted to participate in high school athletics. There was no history of rheumatic fever, but she had had scarletina at the age of ten. She had noticed no dyspnea, edema or palpitation prior to the onset of weakness associated with the present illness.

The physical examination showed a well-developed and nourished woman. The temperature was 99.8 F. and the pulse 104 per minute. The essential findings were as follows: the skin over the lower extremities revealed a purpuric type of eruption which faded during the following forty-eight hours. No other petechiæ were noted. The heart appeared to be enlarged; percussion demonstrating the left border to be 11 cm. from the midline in the fifth intercostal space. The pulmonary conus was prominent. A harsh systolic murmur and a soft diastolic murmur were audible in the second and third intercostal spaces to the left of the sternum, and over the sternum in the corresponding area. The blood pressure was 108/60 in both arms and 110/70 in both legs. The spleen was slightly tender and enlarged, the lower pole extending to the level of the iliac crest.

Urinalysis at the time of admission revealed normal findings. Later, however, albuminuria was constant and associated with hematuria and pyuria. The hemoglobin concentration was 4.4 gm. per cent; the erythrocytes numbered 2,789,000 per cu. mm., and the leukocytes 4,850 with a differential count of 77 per cent neutrophiles, 21 per cent lymphocytes, 1 per cent monocytes, and 1 per cent eosinophiles. A capillary fragility test was positive, but the bleeding and clotting time, clot retractibility, and platelet count were normal. Cultures of venous blood on five occasions showed growth of streptococcus viridans with an initial count of 60 colonies of organisms per c.c. of blood. Terminally, a blood culture revealed 700 colonies per c.c. of coagulase-positive staphylococcus aureus and 10 colonies of streptococcus viridans. A roentgenogram of the chest revealed a slight but generalized enlargement of the heart and clear lung fields. A subsequent roentgenogram of the chest revealed a pleural effusion on the left and probable pulmonary infarcts. An electrocardiogram was interpreted as showing sinus tachycardia, low voltage of the QRS complexes in all leads, a PR interval of 0.21 seconds, and a normal electrical axis.

She left the hospital at the end of five days, but returned twelve days later. During this interval the cardiac murmurs had changed. The diastolic murmur was louder and the systolic murmur was higher pitched. Four days after her second entry, she had an episode of hematuria and pain in her left flank, which was interpreted as being due to a renal infarction. Treatment with sulfadiazine by oral administration was instituted. The relation of sulfadiazine therapy to the leukocyte and differential counts are presented in Table I. Sulfadiazine was given intermittently because of the accumulation of the drug in the blood and inability to insure adequate urine volume. The drug did not produce any clinical benefit. During her hospital stay, she received 2,000 c.c. of whole citrated blood. In addition, she was given erythrocytes suspended in physiologic saline solution, which were obtained from 2,100 c.c. of whole blood. The hemoglobin concentration rose from 4.4 gm. to 12.0 gm. per 100 c.c. Her general condition improved following the transfusions; however, she had several hemoptyses due to pulmonary infarcts. She had a constant fever with an average daily temperature peak of 102° F. On November 4, her leukocyte count decreased from that of the previous count. On November 6, the leukocyte count was 950 cells per cu. mm. with 42 per cent neutrophiles, 56 per cent lymphocytes, and 2 per cent monocytes. Sulfadiazine was discontinued promptly on this day. The next day agranulocytosis existed and persisted until

From the Division of Internal Medicine, and the Department of Pathology, University of Minnesota Hospitals, Minneapolis, Minnesota.

TABLE I. SULFADIAZINE THERAPY IN RELATION TO LEUKOCYTE COUNTS

Date 1942	Total Daily Dose of Sulfadiazine (gm.)	Blood sulfadiazine (mg. per 100 c.c. of free)	Leukocyte Count (per cu. mm.)	Differential Count		
				Neut.	Lymph.	Mono.
10–18	5		6,500	70	30	
10–19	6					
10–20	6		7,400			
10–21	3	21.4				
10–22	0		7,450	69	27	4
10–23	0					
10–24	4	9.1				
10–25	4					
10–26	4					
10–27	4	19.8				
10–28	0	10.6	9,500			
10–29	0					
10–30	0					
10–31	1					
11–1	3					
11–2	3					
11–3	2					
11–4	3	10.5	4,250	68	32	
11–5	3					
11–6	3		950	42	56	2
11–7	0		2,200	0	100	
11–8	0	3.5	2,050	0	100	
11–9	0	2.1	850	0	100	
11–10	0		500	0	100	
Total	54					

death four days later. During this time the total leukocyte count ranged from 2,300 to 500 per cu. mm. With the onset of the agranulocytosis her condition became progressively worse. She was delirious during the last twenty-four hours, and her temperature rose to 106° F. terminally. One small ulceration of the pharyngeal mucous membrane was noted the last day of her life.

The clinical diagnoses were: subacute bacterial endocarditis superimposed upon either an interventricular septal defect, or a patent ductus arteriosus with secondary involvement of the pulmonary valve; pulmonary infarcts and congestion; severe hypochromic anemia; purpura secondary to a capillary toxicosis; and acute agranulocytosis due to sulfadiazine.

Autopsy

Only a limited examination was permitted. The left pleural cavity contained 250 c.c. of clear, serous fluid and the right 50 c.c. There were 150 c.c. of clear fluid in the pericardial sac. The heart weighed 410 grams and showed a normal-appearing left ventricle, but the right ventricle was markedly hypertrophied and dilated. Numerous fresh, cauliflower-like, friable vegetations were found on the pulmonary valve cusps, which also appeared thickened and fibrotic. Microscopically, the pulmonary valves revealed thickening and fibrosis at the base of the valve with old hyaline scar tissue and some fresh proliferation of young connective tissue cells. The free margin showed an extensive ulceration with bacterial masses and platelet thrombi making up the vegetations. The myocardium appeared to be somewhat soft and flabby but showed no areas of fibrosis, infarction, or myocarditis. A small interventricular septal defect measuring 5 mm. in diameter was found in the central membranous portion of the septum. Section of the interventricular septum showed a thick layer of hyaline fibrinoid material covering the surface on which were seen several vegetations of bacterial endocarditis. The vegetations consisted of hyaline fibrinoid material, platelet thrombus and bacterial masses with but occasional leukocytes. Beneath the layer of fibrinoid material there was a layer of old scar tissue, the deeper portions of which show some proliferating fibroblasts. Beneath this there was an active proliferation of young connective tissue cells, a number of capillaries and collections of macrophagus, a few lymphocytes and plasma cells. The right lung weighed 755 grams and the left lung weighed 665 grams. Both lungs were intensely congested, edematous and largely filled with areas of gray and red-mottled confluent consolidation. Two white infarcts measuring 2.5 cm. and 1.5 cm. in diameter were noted in the lateral aspect of the left lower lobe. A large, firm, pale thrombus was found occluding the main artery to the left lower lobe beginning at the origin of the branch. Sections of the lungs revealed areas of infarction, the alveoli being filled with erythrocytes and the interalveolar septæ appearing necrotic. Areas bordering the infarcts showed a cellular reaction consisting chiefly of a proliferation of macrophages. Areas which appeared to be bronchopneumonia grossly, revealed the alveoli to be filled with macrophages, lymphocytes, some fibrin, serum and erythrocytes. No polymorphonuclear leukocytes were noted in the alveolar exudate or in any of the sections. The inflammatory reaction was characteristic of agranulocytosis. No infarcts were noted on the external surface of the spleen. The splenic substance showed an intense congestion grossly and microscopically. The liver edge extended 8 cm. below the right costal margin in the mid-clavicular line and on section there was definite evidence of chronic passive congestion. The kidneys had smooth but swollen surfaces and the cut edge was somewhat rounded and congested but microscopic appearance was normal. The bone marrow of the sternum was red throughout. There was a complete absence of granulocytes, but the erythroid elements appeared to be normal.

The anatomic diagnoses were: acute agranulocytosis; patent interventricular septal defect; subacute bacterial endocarditis of the pulmonary valves, pulmonary conus, and the right side of the interventricular septum; right ventricular hypertrophy with dilation; pulmonary infarcts, bilateral pulmonary edema, and bronchopneumonia; chronic passive congestion of liver, spleen and kidneys.

Summary

A case of subacute bacterial endocarditis is reported in which acute agranulocytosis developed twenty days after instituting therapy with sulfadiazine. The total dose was 54 grams, given over a period of twenty days. The sulfadiazine appeared to have caused the agranulocytosis because no other drugs were administered immediately prior to the onset of the agranulocytosis.

Bibliography

1. Finland, M., Strauss, E., and Peterson, O. L.: Sulfadiazine; therapeutic evaluation and toxic effects on four hundred and forty-six patients. J.A.M.A., 116:2641-2648, 1941.
2. Keefer, C. S.: Toxic reactions following sulfonamides. New England J. Med., 226:226, (Feb. 12) 1942.
3. Kennedy, P. D., and Finland, M.: Fatal agranulocytosis from sulfathiazole. J.A.M.A., 116:295-296, (Jan. 25) 1941.
4. Hoyne, A. L., and Larimore, C. W.: Sulfathiazole as a couse of death; report of patient with acute agranulocytosis. J.A.M.A., 117:1353, (Oct. 18) 1941.
5. Goldman, L. M., Applebaum, I., Anotpol, W.: Malignant neutropenia following the use of sulfapyridine. Am. J. Clin. Path., 11:810-818, (Nov.) 1941.
6. Goldbloom, A. A., Greenwald, L., and Reinstein, H.: Toxic reactions to sulfapyridine. J. Lab. and Clin. Med., 27:139-148, (Nov.) 1941
7. Curry, John J.: Acute agranulocytosis following sulfadiazine. J.A.M.A., 119:1502-1503, (Aug. 29) 1942.

HISTORY OF MEDICINE IN DODGE COUNTY

BY JAMES ECKMAN
Rochester, Minnesota

and

CHARLES E. BIGELOW, M.D.
Dodge Center, Minnesota

(Continued from September issue)

Dr. Jasper Bedient (1838-1920), one of the pathfinders in medicine in Southern Minnesota, was born near Gilbertsville, New York, on May 17, 1838, the son of Alanson Bedient and Linas Kinne Bedient.[218] His father was a farmer of Scotch-Irish descent and his mother was Scotch-English. Both his parents were natives of Otsego County in New York, and the family history in America extended back to before the Revolutionary War. The young man was reared on his father's farm, and received his preliminary education at the local academy in Gilbertsville. He then studied medicine under Dr. C. D. Spencer, and attended the Berkshire Medical College in Pittsfield, Massachusetts, from which he was graduated on November 20, 1860. The thesis which he wrote and defended for his degree was "Primary Syphilis."[219] He then practiced medicine for about one year in Bainbridge, New York, and in 1862 came to Mantorville in Dodge County. In 1866 he removed to Mankato, where he lived for about two years. From Mankato he went to California; but in 1869 he returned to Dodge County, to settle in Kasson.

On June 24, 1871, Doctor Bedient was married to Miss Marinda Atherton, a native of Canisteo, Steuben County, New York,[218] and at about the same time he seems to have been elected a member of the Minnesota State Medical Society. His name appeared in the list of members in the *Transactions* of the society for 1871,[220] but not in the *Transactions* of 1870. He became a member of the American Medical Association in 1877, and was licensed to practice medicine in Minnesota by exemption on April 19, 1884, receiving License No. 877.[40]

Doctor Bedient became county physician of Dodge County, health officer of Kasson, a member of the board of education of Kasson, and a member of the board of pension examiners. In November of 1883 he injured his right arm when his team of horses suddenly bolted and ran wild,[221] and after undergoing an operation at Rochester in 1900 he began to think of retiring. He retired in 1904, and spent the remaining sixteen years of his life in Kasson. There he died on November 24, 1920, at the age of eighty-two years.[222] He had practiced medicine in Dodge County for a total of thirty-five years, and had been a resident of Kasson for more than a half century.

Dr. Reuben Willson (1822-1900) was born in the state of New York in 1822, and after studying medicine with Dr. A. Ames and Dr. Benjamin Walton he entered the old Berkshire Medical College at Pittsfield, Massachusetts.[219,223] At the time he was living in Potsdam, New York. He was graduated from this

institution as a Doctor of Medicine in 1853, and the title of the thesis, "Humbug," which he wrote and defended at his graduation is so unusual that a passage from it may be reproduced herein by courtesy of Miss Fannie G. Clark,[219] historical librarian of the Berkshire Athenæum of Pittsfield, Massachusetts:

> So completely indeed are the sympathies of the people in some localities with quackery that the name physician has become almost a by-word and reproach. . . . Truth is the power toward which he steers, and humanity the power which urges him on. . . .

On June 6, 1853, at Canton, New York, he was married to Miss Emma Ellis,[209] daughter of the well-known American sculptor and artist, Salathiel Ellis (1803-1879), who designed the dies for several of the medals (one bearing the likeness of Lincoln) given to the Indians by the Federal Government. Ellis settled on a farm in Milton Township in Dodge County in 1858, and it seems very likely that he was responsible for bringing his son-in-law, Doctor Willson, to Dodge County in 1866.

On May 8, 1863, Doctor Willson was mustered into service as assistant surgeon of the Eighth Wisconsin Regiment of Volunteers, at Walnut Hills, Mississippi. He was honorably discharged with this rank on August 22, 1864.

As previously said, he came to Mantorville in Dodge County in 1866. He was said to be a good physician, but was troubled to some extent by deafness which ultimately became so severe that it was a prominent factor in his death. There is evidence that he was a respected and adequately favored practitioner while he was in Dodge County. In 1868 he and Doctor Garver were appointed county physicians,[224] and Doctor Willson, as previously indicated, was one of the founders of the Dodge County Medical Society in September of 1869.[33] Doctor Willson became a member of the Minnesota State Medical Society on June 11, 1872, at the fourth semi-annual session of that body at Rochester.[225]

In December of 1877 Doctor Willson removed to Fairmont, Nebraska, and when he left Mantorville the *Dodge County Republican*[226] spoke of him as "an excellent physician, prompt in his attendance upon, and skillful in his treatment of, patients. An old resident here, he leaves many friends behind, who wish him abundant success in his new home."

In August of 1879 Doctor Willson returned to Mantorville with his daughter, who was dying of pulmonary tuberculosis, and it was said that while he stayed in Mantorville he answered professional calls.[227] His daughter died on September 12, 1879, and it is believed that Doctor Willson then returned to Nebraska. By about 1889 his deafness had become so pronounced that he retired from the practice of medicine and moved to San Jose, California. There he lived until 1900. As he was walking down the street in that city in June of 1900 he was struck and trampled upon by a runaway horse attached to a wagon, the noise of which he had not been able to hear. He died a few hours later, on June 19, 1900,[223,228] at the age of seventy-eight years.

Dr. James McLaughlin (1816-1883) was born near Londonderry in the North of Ireland on April 17, 1816.[229] He was brought to the United States as a boy by his parents, and it is believed that he was reared in Coshocton County, Ohio.[84] He taught school in Coshocton County for a number of years, and in 1844 began to study medicine with Dr. Lorenzo James of Coshocton.[84] In 1848 he attended a course of lectures in medicine at the old Cleveland Medical College, and it has been said that he was graduated from this institution with the degree of Doctor of Medicine in 1849.* He began the practice of medicine,

*It has not been possible to check this particular date. In another source (Reference No. 84) it was implied that Doctor McLaughlin was graduated from the Cleveland Medical College in 1853, and that he returned thereupon to Ohio.

possibly in Coshocton County, Ohio, and in 1851 moved to Southern Michigan.[229] Later he moved to Beaver Dam, Wisconsin, and in 1866 he came to Mantorville in Dodge County, as has been shown herein. He served as a member of the town council, member of the board of education of Mantorville, and as a member of the board of supervisors of Dodge County.[84]

Lord[1] called Doctor McLaughlin "perhaps the most highly educated man among the early day physicians," and said that he was "a very quiet and dignified man, whom everybody respected." Doctor McLaughlin was a staunch Republican, active in party councils and in practical politics as well. He was a wealthy man when he came to Dodge County, and although he still acted in consultation with other physicians on occasion, it is believed that he was keenly interested in real estate, rather than in medicine, in his later years. This gave him time to engage in politics. He was elected to the Minnesota State Senate from Dodge County in 1880, and was reëlected in 1882. It would seem, therefore, that he had at least a part in the drafting and passage of the medical practice act of 1883, which was enacted by the twenty-third session of the State Legislature.[95] While Doctor McLaughlin was serving in the Minnesota State Senate in Saint Paul in 1883 he fell victim to pneumonia. He was sixty-seven years old at the time, and had suffered from renal insufficiency for years. His weakened resistance gradually receded, and he died of pneumonia at the Sherman House in Saint Paul on February 22, 1883.[116,229] He was buried in the cemetery at Mantorville. By the terms of his will he bequeathed $10,000 to Hamline University of Saint Paul.[229]

Very little is known about **Dr. John B. Willson** of Kasson. He came to that town in July of 1867, when Kasson was about two years old and had a population of only about 100. At the time the *Dodge County Republican*[31] said of him:

> We learn that Doctor Willson, a gentleman from the East, and a brother of Doctor Willson of Mantorville, has made arrangements to locate at Kasson, and has commenced the erection of a house. We welcome him to our midst, and trust his residence among us will be both pleasant and profitable.

In September of 1867 Doctor Willson's professional notice in the *Dodge County Republican* was as follows:

Dr. J. B. Willson
Physician and Surgeon
Office in the Drug Store
Residence at the head of
Main Street, Kasson
Graduate of Castleton Medical School, Vt.*

In December of 1867 the *Dodge County Republican*[230] remarked that "Doctor Willson of this village is growing in popularity almost daily. He understands his profession, and if the country was not quite so healthy, he would do a thriving business."

Doctor Willson, a little later, used the columns of this newspaper[231] to express his gratitude for what seems to have been a gift of the townspeople of a buffalo robe and other articles.

Doctor Willson's son, Cullen R. Willson, died in Kasson in 1870,[232] but from that year onward nothing is known about the physician. He was said to have been advanced in years when he came to Kasson in 1867, and it is believed that at some

*Castleton Medical College, Castleton, Vermont.

time in 1874 he retired from the practice of medicine and removed to California. His professional notice appeared for the last time in the issue of the *Dodge County Republican* of Kasson for May 1, 1874.

Dr. Charles Severin Beaulieu (1835-1896) was born in France in the Department of the Loire on February 11, 1835.[75] At the age of five years he was brought to the United States by his parents. His father was a French political exile. The boy lived for ten years in Canada, and later in Oswego County, New York, but he was educated in France for the Roman Catholic priesthood, a faith and a career which he renounced after he had occupied a vicarage somewhere in France.[75] He returned to New York State, and at the outbreak of the War of the Rebellion, at the age of twenty-six years, he decided to enter the Union armies. He thereupon raised a company of vounteer infantrymen, and on May 17, 1861, at Elmira, New York, was mustered into service as a first lieutenant in command of Company D of the 24th New York Infantry Regiment of Volunteers.[204] On January 15, 1863, he was discharged from the service so that he could accept a captaincy. On January 16 of the same year he was sworn in as captain of the company he had previously served as first lieutenant.[204] Records consulted by the authors indicate that he was mustered out of the army and honorably discharged as a captain at Elmira, New York, on May 29, 1863.[204] It may also be that he served as captain of Company H of the 4th United States Veteran Volunteer Infantry Regiment,[75,209] perhaps until as late as 1867.

Doctor Beaulieu, in about 1867, went to Indianapolis, where he remained until 1868. His second wife died at Kentland in Indiana.[75] In 1868 he removed to Concord in Dodge County, and he stayed there until November of 1880. In June of 1878 it was remarked[74] that he had narrowly escaped mishap on the road when his horse was frightened by a dog. In November of 1880 he was called to Brownsdale in Mower County to be pastor of the Christian Church there, and in October of 1882, at Minneapolis, he was ordained as an evangelist of the Christian Church.[75] He was licensed to practice medicine in Minnesota on December 31, 1883, by exemption.[40] In Brownsdale he became chaplain of the Colonel Henry Rogers Post* No. 11 of the Grand Army of the Republic.

How long Doctor Beaulieu remained in Brownsdale it is not known; but is was said[40] that in 1895 he was living in the village of New Haven, in Franklin County, Missouri. The postmaster of that village, after interviewing old residents thereof, said that Doctor Beaulieu apparently contented himself by running the town newspaper and preaching in the Christian Church. He was characterized[77] as "a large man, a good minister, had a very good voice, and it seems was very well educated." It does not appear that he practiced medicine in Missouri, for he was never licensed to practice in the state[76] or in Franklin County.

So far as is known, Doctor Beaulieu was married four times. His third wife was Mrs. Lena Green Slocum, widow of Dr. Julius Franklin Slocum (1843-1874), who had come to Mantorville in 1853 with his parents, but who died in Marion in Olmsted County.[50] Since Doctor Slocum lived until 1874, it is probable that Doctor Beaulieu's marriage to Mrs. Slocum took place after 1874. She was a native of Vermont,[75] but had been reared in Dodge County. Doubtless she was the young widow who, Woods[13] and Moreland[67] said, was

*Named for Lieutenant-Colonel Henry C. Rogers (1834-1871) of Brownsdale, who had settled there in 1856. He was secretary of state of Minnesota from 1866 to 1870, and had served as lieutenant-colonel of the Ninth Minnesota Regiment of Volunteer Infantry.

married to Doctor Beaulieu while the physician-clergyman was practicing in Concord.

Doctor Beaulieu died in DeSoto, Missouri, on December 15, 1896.[209] On February 2, 1897, application for a widow's pension, on the basis of Doctor Beaulieu's service in the War of the Rebellion, was made by Mrs. Alice S. Beaulieu.[209] It is assumed that this was the woman Doctor Beaulieu married while he was in New Haven, as mentioned by Grannemann.[77] Presumably she was Doctor Beaulieu's fourth wife.

Dr. Stephen William Ranson (1843-1904) was born in Kalamazoo, Michigan, on May 13, 1843, the son of George Ranson, a native of London, England, and Julia Ann Parker Ranson, a native of Staffordshire, England.[233] The first four years of his life were spent in Michigan, and the next nine years were spent in Canada. In 1856 his parents removed to Dodge County to settle on a farm in Mantorville Township. The young man attended the old Minnesota Seminary at Wasioja, and during the winters of 1864 and 1865 taught school in Olmsted County. In the fall of 1865 he began to study medicine under the preceptorship of Dr. T. G. Jones of Janesville, Wisconsin. On November 21, 1865, he was married to Miss Mary Elizabeth Foster, of New York State.[233] He studied with Doctor Jones for a year and eight months, and attended a course of medical lectures at the University of Michigan during the winter of 1867-1868. He completed a second course of lectures at the Chicago Medical College, from which he was graduated as a physician on March 22, 1870.[233] On April 3, 1870, he began the practice of medicine in Dodge Center, as the first permanent physician the town had ever had. In 1872 he opened a drug store in the village, operating it until 1878.

Doctor Ranson became a member of the American Medical Association in 1882. He was licensed to practice medicine in Minnesota on December 31, 1883, under Certificate No. 587,[40] and some three years later, at the eighteenth annual session of the Minnesota State Medical Society in Minneapolis on June 17, 1886, he was elected a member of that organization.

Doctor Ranson, as has been shown,[123] was accustomed to bring certain of his patients to Rochester, where Dr. William Worrell Mayo (1819-1911) or Dr. William J. Mayo (1861-1939) or Dr. Charles H. Mayo (1865-1939) would attend them. Dr. William J. Mayo and his father have recorded one such incident.[123] Doctor Ranson had called the Mayos, father and son, to operate, if possible, on one George Cooper of Kasson, who was seventy-two years old at the time. He was suffering from strangulated hernia, and apparently had sought homeopathic attention. "In the hands of homeopaths he had been maltreated for eleven days," the two Mayos[123] declared, "and upon arrival found him in a condition hardly to warrant an operation." They nevertheless operated upon the aged patient; but he died four weeks later.

In 1891 Doctor Ranson operated, with the assistance of Dr. Samuel H. Van Cleve (1853-1912) of Mantorville and Dr. Osmon F. Way of Claremont, upon a woman who had a deep vesico-ureterovaginal fistula. The operation was a success, and apparently represented something of an achievement for Doctor Ranson,[234] who observed:

> Urinary fistula is a theme on which medical men do not seem inclined to dwell. Hence the literature on this subject is rather mediocre. This apparent apathy is no doubt due to the unfavorable results in this field of surgery, fully fifty per cent requiring more than one operation, while at least ten per cent are incurable.

Doctor Ranson was recognized as a valuable citizen of Dodge Center. He was the chief supporter of the Methodist Episcopal Church there, and for more than thirty years was superintendent of that church's Sunday school. He was a heavy, powerful man, more than six feet tall.

In April of 1897 Doctor Ranson was elected president of the Southern Minnesota Medical Association,*[235] but this honor was soon overshadowed by the death of his young son, Dr. George Ranson (1871-1899), who had been associated with his father in Dodge Center from his graduation from the University of Minnesota College of Medicine and Surgery until 1898. He died of what appears to have been acute nephritis or renal insufficiency of some type, at Saint Peter, Minnesota, on June 8, 1899.[236]

Doctor Ranson died in the line of arduous duty. Summoned to the home of a patient some two miles from Dodge Center in February of 1904, he reached the place in great physical distress. He was in such a condition that he had to be helped into the house. Mrs. Ranson and Dr. Charles Sumner Bigelow (1845-1931) of Dodge Center were called, but both arrived too late for Doctor Ranson to be able to recognize them.[237] He died in this patient's home on February 3, 1904, of some form of cardiac disease, and was buried in the cemetery at Dodge Center.

"Perhaps no man in the county was better or more widely known than Doctor Ranson," it was written.[238] ". . . Although he was a graduate from a good medical school, his education was never finished. He was a student all his life and his patients had the benefit of all new discoveries in the science of medicine."

Three of Doctor Ranson's children became physicians. One of them is still alive (1943): Dr. Mary Eliza Ranson Strickler (1873-) of Sleepy Eye, Minnesota, and Long Beach, California. Another, Dr. Walter Stephen Ranson (1880-1942), was professor of neurology and director of the Neurologic Research Institute of the Northwestern University Medical School at the time of his death, and a well-known figure in American neurology. He was the author of the text, *The Anatomy of the Nervous System,* which he was revising at the time of his death, and was an accepted authority on the structure and certain functions of the peripheral nervous system. He died in Chicago, on August 30, 1942.[239]

*He had been first vice president in 1895.

(To be continued in the November issue.)

References will appear at the conclusion of this article.

President's Letter

THE MEDICAL PROFESSION CAN DO IT

We may well view with alarm the provisions of the Wagner-Murray Bill which would put the control of all medical service in the United States in the hands of the Surgeon-General of the Public Health Service. Centralization of power in Washington has already gone much too far and there is a widespread and insistent demand that powers of government be de-centralized and that the states and local governments resume their proper functions. However, we overlook the fact that the Surgeon-General of the Public Health Service possesses no knowledge that is not possessed by the medical profession, and that, but for the failure of the organized medical profession in the various states to put that knowledge to practical use, there would be no need for a United States Public Health Service at all. The Minnesota State Medical Association is amply able to take care of the public health needs of Minnesota.

Of course, the national health services are so thoroughly and firmly intrenched that it is foolish to suggest abolishing them, and even a curtailment of their powers would meet strong opposition. Under the circumstances, the medical profession should at least do all that it can to prevent further extension of those powers.

The Committee on Industrial Health of our Association, met a few days ago and the greater part of the time was consumed in a discussion of mass surveys of workers with a view particularly to the discovery of cases of tuberculosis. This involves, of course, a large number of x-ray examinations of the chest. The cost of such surveys, at the fees ordinarily charged by roentgenologists, is prohibitive. Mass surveys of this kind are made economically feasible by the use of miniature films: viz 35 m.m. or 4x5 inch films. In some instances commercial organizations which specialize in such mass x-ray surveys have been called in by an employer to examine the employes. If objection is raised that this commercial x-ray concern is practicing medicine in the state, without a license, then the films are taken outside the state to be read. This is certainly not a wholesome condition. Industry is willing to coöperate with the medical profession and would, I believe, prefer not to have any more government bureaus to deal with.

No solution is offered or even suggested here; but the purpose of this letter is to emphasize the fact that the demand is here. The medical profession has the facilities, the talent and the knowledge. It should have the wisdom and the statesmanship to find the means to meet this demand, and thus leave no excuse for the entrance of any Public Health Service, or any other governmental agency.

Stephen W. Baxter

President, Minnesota State Medical Association

Editorial

Carl B. Drake, M.D., *Editor;* George Earl, M.D., Henry L. Ulrich, M.D., *Associate Editors*

THE A.H.A. AND THE A M.A.

At the last meeting of the House of Delegates, the involved question of the propriety of hospitals furnishing the services of physicians such as those in charge of x-ray departments, laboratories and anesthetics in addition to room, board, nursing, et cetera, received special attention. The reference committee which considered the report of the Board of Trustees which included the results of an extensive study of the question, made the recommendation in brief that the furnishing by hospitals of services of physicians (x-ray, laboratory and anesthesia specialist) is injecting a third party (the hospital) into the furnishing of medical care, and is fundamentally wrong. The committee further recommended that the House of Delegates urge the American Hospital Association not to include x-ray, laboratory, and anesthesia in its hospital service contract.

The hospital service organizations which have shown such phenomenal growth in recent years have benefitted the public, the hospitals, and the medical profession. The contracts provide in some cases for certain maximum x-ray costs and a percentage of specified x-ray charges, anesthetics, and limited laboratory charges in addition to specified allowance on the hospital bill for room, board, dressings, and floor nursing service. The contract is substantially insurance against the cost of services usually supplied by the hospitals.

It is the increase in the number of hospital service contracts which has doubtless brought to a head the question of the propriety or advisability of hospitals supplying the services of doctors such as those mentioned, to any patients. We have heard no protests against the hospital furnishing the services of young doctors such as interns and residents, or of nurses or pharmacists.

A hospital to be more than a hotel must supply certain medical services. The hospital must have x-ray and laboratory equipment and should have a medically-trained individual in charge. The stumbling block seems to be the method of compensating the x-ray, laboratory, and anesthesia specialist. From the hospital standpoint, the usual salary basis obviates a lot of bookkeeping. A method of designating a percentage of the x-ray bill as fee for the x-ray specialist is one alternative which, however, might be open to abuse.

The criticism voiced in the committee report mentioned that in many cases the x-ray specialist is underpaid, is remediable. The criticism that hospital x-ray charges are excessive might be met with the question whether they are more than those of the x-ray specialist in private practice. And that question raises the further one whether the charges for x-ray work are not out of line and more than are justified by cost of equipment, replacement, and operation.

X-ray service when needed constitutes one of the expensive items for the sick. It is highly desirable from the patient's standpoint that its possible need should be included in a hospital service contract. Lowering the cost of illness is one of the aims of the medical profession. The hospital service organization does not determine the compensation of the employed x-ray specialist but insures against hospital expense which may include x-ray service. So the problem reverts to the proper method of compensating the medical man serving the hospital.

It is perfectly true that it is very important that no third party should control the dispensation of medical care by the physician to the patient. There is little danger that hospitals will ever act in this capacity as third party. There may be some danger that hospital service organization might attempt to expand the present provisions of their contracts to include more than diagnostic medical service. This, however, would constitute medical practice by a corporation which is contrary to law.

We have tried to present an unbiased picture of the unfortunate controversy which has arisen

between the A.H.A. and the A.M.A. We would welcome a proposal which would solve the provision of the above-mentioned medical services in the hospital better than the present system.

—C.B.D.

SUDDEN DEATH FROM CORONARY OCCLUSION

THE cause of sudden death from coronary occlusion is frequently not explained at autopsy. In some the heart has ruptured, and an embolus from a mural thrombus is another possibility. In an appreciable number, however, the infarcted area in the myocardium is not very large and does not explain a sudden exodus. In the few instances reported where an electrocardiogram was being taken at the time of death, the record has shown an asystole or a fibrillation of the ventricle.

Many experimental ligations of branches of the coronary arteries have been carried out which have thrown considerable light on the subject.* The ligation causes an infarct in the heart muscle with rapid degeneration in the affected muscle. The ligation is immediately followed by a fall in blood pressure, extrasystoles, or a bradycardia and then a tachycardia with a swelling of the myocardium outside the infarct. The contractions of the ventricle become more feeble and rapid, and in fatal cases ventricular fibrillations supervene. Perhaps the most important fact observed in such experiments is the clearly demonstrated generalized coronary vasoconstriction in the non-obstructed coronary vessels. In some fatal cases, areas of ischemia outside the infarct have been observed. It has also been observed that a fatal outcome is much less likely to occur if the ligation is carried out under morphine and a general anesthetic. This observation doubtless led certain experimenters to test the effect of atropine and the xanthine drugs (theobromine, theophyllin and theophyllin with ethylenedramine (aminophyllin) on the reflex spasm. They found that animals administered atropine and/or aminophyllin were much more likely to survive the ligation than controls.

It seems logical to assume that much the same sequence of events occurs in the human heart following coronary occlusion or thrombosis. If so, the generalized reflex vasoconstriction of the non-obstructed coronary vessels, which leads to ventricular fibrillation and explains sudden exitus, is an important consideration. According to LeRoy and Snider,† atropine and aminophyllin are indicated in any patient with coronary occlusion whether the symptoms are severe or mild. Atropine sulphate (1/75 grain) intravenously or aminophyllin (5 to 7½ grains) in 20 c.c. of water given slowly intravenously is indicated at once, and the effect of the drug maintained by intravenous or mouth medication. While morphine is usually required to control the pain in coronary occlusion, it does not serve to break the reflex vasoconstriction, and either atropine or aminophyllin is necessary. Quinidine, too, does not serve the purpose.

We know of no published results of experience in the use of this additional medication from localities in which it is being used, but it would seem that this is a contributon to the treatment of this prevalent disease.

MUSCLE CO-ORDINATION AND ENDURANCE

THE mobilization of man power for war has led again to the revelation that a large percentage of our young men are physically below the standard requirements. This is doubtless true of all countries, and there is no reason to believe that the young men in our country are inferior to those in any other, although comparisons are impossible.

Many of the defects found are not preventable and some are not remediable. The correction of some defects does not qualify the individual for military service. An appreciable number of disabilities can be traced to nutritional defects due more to ignorance in the matter of diet than to inability to obtain proper food. The field of nutrition and dietetics of necessity is receiving concentrated attention at present.

One requirement of a good fighting man which is not uncovered in the examination of a draftee is his muscle coördination and endurance. Although this ability or its lack becomes manifest when it comes to trying out individuals for special military activity, its detection requires a special form of examination.

A report of the examination of first-year male

*Manning, G. W., McEachern, C. G., and Hall, G. E.: Reflex coronary artery spasm following sudden occlusion of other coronary arteries. Arch. Int. Med., 64:661, (October) 1939.

†LeRoy, George V., and Snider, S. S.: The sudden death of patients with few symptoms of heart disease. J.A.M.A., 117: 2019, (Dec. 13) 1941.

college students at the University of Illinois by Cureton* reveals the woeful lack of physical agility and strength in a large percentage of those examined. The tests used consisted of athletic stunts commonly performed in a gymnasium including high and broad jump, pull up and push up, vaulting over a bar, leg lift and sit up, and swimming. In brief two-thirds could not swim fifty yards, a quarter could not chin themselves five times, and two-fifths could not "skin the cat."

The tests used were for endurance as well as agility and indicated the individual's "condition" as well as training in the coördination of his muscles. The value of agility and strength is not limited to its demonstration in a gymnasium. In war time the ability to "run, jump, dodge, fall, climb, swim, ride, lift and carry loads, and endure long hours of continuous work" is definitely life saving. In peace time there are, too, occasions when agility stands one in good stead. Awkwardness and early fatigue are the cause of many accidents.

While athletics plays a prominent part in American life, there is indication that the youth of this country would be better off if more participated and fewer sat in the grand stand. Because of the greater number of students in the high schools, it is there, especially, that greater interest should be aroused in developing muscular skill and strength as a preparation for adult life, be it in peace or war time.

FINGERPRINTING OF MEDICAL STUDENTS AND PHYSICIANS

MAURICE H. REES, Dean of the University of Colorado School of Medicine and Hospitals, has recently pointed out the frequency with which medical schools might have avoided embarrassment by proper identification of persons presenting transcripts and other school records. Medical imposters, too, frequently escape recognition because of carelessness in identification of important records. Because of the legal aspects of medical education and licensure, Rees recommends that schools should require fingerprint records of all medical students and urges that diplomas and licenses carry fingerprints on the backs. All certificates of specialization might carry similar identification in order to lessen the likelihood of theft or other loss and subsequent arrival in unauthorized hands.

Since fingerprinting appears to be an infallible method of human identification, its use will probably become universal. The medical profession should be among the leaders in attempting to overcome public reluctance to be fingerprinted because of the common association between fingerprint identification and criminology. Since there are personal advantages in having one's fingerprints recorded the profession might well encourage such identification of its present members as well as those now in medical school. Larger medical meetings might be used to offer to the physician a convenient opportunity for recording his fingerprints.

POLIOMYELITIS AND EPIDEMIC MENINGITIS

ACCORDING to reports poliomyelitis has been epidemic in many parts of the country. Minnesota has been fortunate in the comparatively few cases reported so far this year. Up to September 18, 1943, there have been only eighty-two cases with five deaths among Minnesota residents reported to the State Department of Health. There have been, however, eleven additional cases, two of them fatal, in out-of-state residents brought from neighboring states for treatment. As is usually the case, there were few cases (six) in the first six months of the year. In July the number reached thirteen, including one death, and in August, forty-seven, including two deaths. Up to September 18, the number had fallen off somewhat as only sixteen cases with two deaths had been reported although doubtless there has been some delay in the reporting of new cases during this month. Minneapolis and Saint Paul have had almost the same number of cases and about as many together as the rest of the state. The total number of cases and deaths up to September 18 is approximately the same as for the entire year of 1942. In 1942, there were 83 cases (nine deaths); in 1941, there were 306 cases (thirty-eight deaths); in 1940, there were 258 cases (twenty-six deaths); in 1939, there were 564 cases (fifty-three deaths); and in 1928, there were 48 cases (ten deaths).

As reported in other parts of the country, there has been a decided increase in epidemic menin-

*Cureton, Thomas K.: The unfitness of young men in motor fitness. Jour. Am. Med. Assn., 123:69, (Sept. 11) 1943.

gitis in Minnesota in 1943. Up to September 15, eighty-five cases with eleven deaths had been reported. The record shows a rather even distribution in the number of cases each month for the first six months of the year with about twelve cases each month except in March, when there were eighteen. In July, August, and September, the number has fallen considerably with eight, three, and one case respectively. Compared with recent years, the mortality of eleven in eighty-five cases is considerably reduced doubtless due to sulfa therapy. For instance, in 1942 eight of eighteen cases were fatal; in 1941, eight of twenty-three; in 1940, eight of nineteen; in 1939, five of seventeen; and in 1938, thirteen of thirty-nine. In previous years, the mortality was about fifty per cent.

The above figures were kindly furnished by Dr. O. McDaniel of the Division of Preventable Diseases of the Minnesota State Department of Health.

The polio epidemic this year first made its appearance in Southern California, involving eventually much of the country. From Texas to Oklahoma and Kansas and Illinois it seemed to jump to Connecticut. Further inroads were made into Oregon and Washington.

Official figures for the entire country showed 2,317 cases up to July 31 this year, compared with 1,020 last year. The total for the first thirty-three weeks of the year was 4,059, the largest number for the corresponding period of any year since 1934. The comparable figure for that year was 4,065, or about 56 per cent of the total for that year.

The total of meningococcus meningitis cases reported in the country for the first thirty-three weeks of the year was 13,528 as compared with 2,396 for the same period last year.

HEALTH AND ACCIDENT INSURANCE POLICIES

At a meeting of the Councilors of the Minnesota State Medical Association, held on October 3, 1943, the Council was informed that representatives of the Mutual Benefit Health and Accident Association of Omaha had approached members of our Association and stated that they had a letter signed by the Councilor of that district in which the Councilor had recommended their health and accident policy. If the physician had taken sufficient time to read the letter, he would have observed that this was a misrepresentation, and that the letter was merely one of introduction. It was decided by the Council to publish a notice explaining that the signature of the Councilor on the letter presented by the insurance company was only a matter of introduction and in no way sponsored the Insurance Company or recommended its policy. —E.M.H.

MEDICAL AND SURGICAL RELIEF COMMITTEE OF AMERICA

To help the Medical and Surgical Relief Committee continue its vital work of providing emergency medical kits to Coast Guard patrol boats, Navy sub-chasers, minesweepers and destroyer-escorts, Claude C. Kennedy, Minnesota, chairman of the Committee, has issued an urgent appeal to surgeons, physicians and medical supply houses for drugs and spare discarded instruments.

Among the items needed to equip the emergency kits are artery clamps, splinter forceps, scalpels, probes, grooved directors, sulfadiazine tablets, sulfadiazine ointment 5 per cent, sulfathiazole tablets, and sterile shaken envelopes of crystalline sulfanilamide. Other medicines and surgical instruments are, of course, equally welcome.

All salvaged instruments sent into Committee Headquarters in New York are rigidly inspected, classified and reconditioned if necessary, before they are packed into the casualty units. No open boxes or bottles of medicines are acceptable.

The sub-chaser or patrol-boat kit, specially designed by Committee doctors for the small sub-hunting, doctor-less craft, is a compact case carrying essential medications and an instrument roll. According to Dr. Kennedy it is prepared to give immediate treatment to casualties until the ship reaches a base hospital. Dr. Kennedy pointed out that detailed instructions are included in each medical unit to insure effective use of its contents by non-medical officers.

"Hundreds of appreciative letters in the Committee's files testify to the pressing need for such medical kits," declared Dr. Kennedy. "They emphasize the urgency of the job the Committee is tackling—a job dedicated to shortening Allied casualty lists. I hope every Minnesota doctor will contribute a salvages instrument to the Medical and Surgical Relief Committee—the only war relief agency devoted solely to medical aid"

The Committee celebrating its third birthday this month was organized and is conducted by physicians and surgeons, to send medical and surgical supplies to the armed and civilian forces of America and her Allies. To date over $562,000 of medicines, instruments, vitamins and other equipment have been donated by the Committee to military and maritime units of the United Nations, to needy hospitals, war-zone welfare agencies and civilian defense posts throughout the free world.

Spare instruments and drugs should be sent to Dr. Claude C. Kennedy, 807 Physicians and Surgeons building, Minneapolis, Minnesota.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

RESPONSIBILITY IN TERMINAL ILLNESS OF RECIPIENTS OF OAA

The difficulty in securing payment for medical and hospital services to recipients of Old Age Assistance during terminal illness has caused much hardship and injustice for physicians and hospitals in Minnesota.

The source of the difficulty lay in the fact that federal grants-in-aid are used to pay Old Age Assistance grants and the amount allowed to recipients, including allowances for medical and hospital care, was limited to a maximum of $30 a month. While payment for treating other ailments might be made on an installment basis over a period of months or years, the monthly allowance did not and could not cover costs incident to terminal illness. For that reason, the physician or the hospital or both have usually gone unpaid and the county welfare board, having no specific direction to the contrary, has usually advanced the federal regulations as justification for refusing to pay the extra costs.

It is therefore of great interest to physicians to know that relief legislation now on the statute books provides for the situation, in the opinion of the Attorney General, and that the local unit of government, county, city, village or township, as the case may be, under the state law, is responsible for these costs.

The Attorney General's opinion on this important matter was given in response to two inquiries made by State Senator Henry C. Stiening of Moorhead, chairman of the Senate Committee on Public Welfare. The complete correspondence between Senator Stiening and the Attorney General's office is printed below for the information of all physicians serving recipients of Old Age Assistance in Minnesota. The medical profession of Minnesota is greatly indebted to Senator Stiening and Attorney General Burnquist for their aid in clearing up this matter.

March 11, 1943

Attorney General
State Capitol
St. Paul, Minnesota

Dear Sir:

Would you be good enough to advise me who or what political subdivision is legally liable for medical, surgical, or hospital care rendered during the last illness of a recipient of old age assistance in a case such as the following:

The recipient of old age assistance is receiving the maximum of $30 per month and must, of necessity be hospitalized and receive medical care for an ailment such as cancer or some disabling injury such as a fractured hip, and the recipient has no other resources except the $30 per month. This obviously would not pay for a month's hospitalization nor medical care nor necessary medicines and drugs for that period of time. The illness or ailment results in the death of the recipient.

I further submit the following question in reference to an old age recipient who receives $30 per month as a grant, $5 of which is allotted for medical care and hospital expenses. However, the old age recipient spends the money and fails to pay either the doctor or the hospital. In that case, can recovery be had by the doctor or hospital from the county or town poor fund?

Both of the above questions arise in Section 3199-15, Mason's Minnesota Statutes.

Yours very truly,
HENRY C. STIENING
State Senator, Clay and Wilkin Counties.

HCS-G

St. Paul, Minnesota
March 17, 1943

Hon. Henry C. Stiening
Senator
State Capitol

Dear Sir:

In your letter of March 11 to the Attorney General you inquire what particular subdivision is liable for medical, surgical, or hospital care rendered during the last illness of the recipient of old age assistance in the following cases: (a) When the recipient is receiving the

maximum assistance allowed and must be hospitalized, and (b) when the recipient is receiving the maximum grant of $5.00 and which is allotted for medical care and hospital expense but which he spends for other purposes. You further inquire in the last case whether the doctor who treats the patient is entitled to recover from the county or town.

Laws of 1941, Chapter 466, Section 2, amending Mason's supplement 1940, Section 3199-15 in subdivision c thereof it is provided:

"While a recipient is receiving old age assistance, he shall not receive any other relief from the state or from any political subdivision thereof, except for medical, dental, surgical or hospital assistance, or nursing care."

It thus appears that the hospital assistance embodied in your first question may be paid in addition to the maximum allowance for old age assistance.

The second question appears to be one of administration. If the recipient is not spending his money for the purpose for which it is allocated to him, the remedy lies with the welfare board. The welfare board need not go on paying him money for a specific purpose after it knows that he is not using the money for that purpose.

The doctor would have no claim against the county or town because his services were not engaged by the county or the town.

Yours very truly,

J. A. A. Burnquist
Attorney General
(Signed) Charles E. Houston
Assistant Attorney General.

CEH-lk

March 26, 1943

Attorney General
State Capitol
St. Paul, Minn.
Attention: Mr. Charles E. Houston.

Dear Sir:

Supplementing my letter of March 11 to the Attorney General and replying to your letter of March 17, you do not make clear in your opinion "what particular subdivision is liable for medical, surgical or hospital care rendered to a recipient of old age assistance," as specified in my previous letter.

It would seem that Section 3199-15, as amended by Laws of 1941, Chapter 466, makes it clear that a recipient of relief may under certain circumstances be entitled to medical, dental, surgical or hospital assistance, including nursing care, over and above the old age grant. The point that I am particularly interested in is what agency of the government or what political subdivision is liable therefor.

I would greatly appreciate hearing from you at your very earliest convenience.

Yours truly,

Henry C. Stiening
State Senator Clay and Wilkin Counties.

HCS-G

St. Paul, Minnesota
March 29, 1943

Honorable Henry C. Stiening
Senate Chamber
State Capitol

Dear Sir:

On March 17 you were given an opinion in response to your inquiry of March 11. On March 26 you inquired what particular subdivision is liable for medical surgical or hospital care rendered to a recipient of old age assistance mentioned in the former correspondence.

This question should be answered that the municipality of the recipient's settlement is the public body liable for such assistance. I cannot make the answer more definite because in some areas the county is the municipality charged with the support of the poor whereas in other areas the city, village or town is responsible for such assistance.

To illustrate: In Hennepin County they have the so-called town system of relief whereby the city or town in which the poor person lives is charged with the relief granted. In other counties where the county system prevails all assistance is paid by the county as distinguished from the town, city or village.

When we know the system that prevails in the particular county, then we can specifically answer your question. For example, if the county system prevails the county would be responsible, whereas where the town system prevails the city, town or village would be responsible.

Yours very truly,

J. A. A. Burnquist
Attorney General
(Signed) Charles E. Houston
Assistant Attorney General.

CEH-lk

CORPORATION PRACTICE ILLEGAL IN MINNESOTA

Arrangements for medical service to migratory workers who were imported from Jamaica, in accordance with agreements with the Department of Agriculture, have run into difficulties in Minnesota.

Initial medical examinations for these workers were financed through transportation funds supplied by the Farm Security Administration. But when the workers were established and employed the responsibility of the Farm Security Administration came to an end and its duties were assumed by the War Food Administration of the Office of Labor.

Plans were immediately set in motion to provide medical service to the workers by local phy-

sicians on a fee basis. But the problem of adopting a fee schedule and paying the fees, under the circumstances, offered difficulties.

Association Formed

The solution arrived at by the various authorities involved took the form of an association called the Midwestern Agricultural Workers' Health Association with headquarters and incorporation in the State of Indiana. This association was to serve as the means of providing health services to migratory agricultural workers who could not obtain the specified services from other sources. The association was to serve all of the workers in Ohio, Indiana, Iowa, Illinois, Missouri, Wisconsin, Michigan, and Minnesota, the states in which these laborers were employed. Dr. Franklin Crockett of Lafayette, Indiana, was elected president of a board of seven directors, of whom three were to be physicians in good standing in their state medical societies.

In due course, the new association petitioned the Secretary of State of Minnesota for permission to operate here and, as a result, a new aspect of the situation which apparently failed to occur to the incorporators has now developed.

That aspect is this: the Midwestern Agricultural Workers Health Association is a corporation and, as such, it cannot practice medicine or dentistry in Minnesota.

To permit it to do so, even in the name of the war emergency to handle a temporary situation, would not only be illegal but would open the way to the corporate practice of medicine by any organization from Indiana or any other state which wished to set up a subsidiary in Minnesota.

Season Nearing End

The matter is still pending in the office of the Secretary of State, awaiting further information and explanation from the directors of the corporation in Indiana.

It is quite certain, in any event, that no such plan as contemplated in the original petition will be countenanced. Some other method will probably have to be developed for medical care of Jamaican workers in Minnesota.

The fact that the season for employing these workers is nearly over makes the emergency less acute and may persuade the backers to drop further negotiation on the matter.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. Du Bois, M.D., Secretary

Minneapolis Pharmacist Pays $500.00 Fine for Furnishing Abortion Instruments

Re:State of Minnesota vs. Harold V. Smetana.

On September 18, 1943, Harold W. Smetana, 43 years of age, a registered pharmacist operating a drug store at 14 27th Ave. S. E., Minneapolis, paid a fine of $500.00 in the District Court of Hennepin County, following his plea of guilty to an information charging him with the crime of practicing healing without a basic science certificate.

Smetana was arrested April 19, 1943, following the filing of a complaint against him by the husband of a twenty-one-year old Minneapolis woman, who was found dead after she had obtained certain instruments from the defendant Smetana for the purpose of attempting an abortion. The cause of death was given as an air embolism. Smetana denied that he sold the instruments, but admitted that he had loaned them to the deceased. The defendant entered a plea of guilty on May 19, 1943, before the Hon. W. W. Bardwell, Judge of the District Court. Sentence was deferred until July 14, 1943. In view of the fact that this was the second time that the defendant has been in difficulty with the legal authorities, the Minnesota State Board of Medical Examiners suggested to the Court that the defendant ought to dispose of his drug store and find some other suitable work. Judge Bardwell approved of the recommendation and gave the defendant a reasonable length of time in which to dispose of his drug store. On September 18, the defendant presented to the Court a bill of sale of the drug store and the Court modified the sentence by imposing a $500.00 fine in place of a one-year workhouse sentence imposed July 14.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Physicians Licensed April 10, 1943

March Examination

Anderson, David Mahlon, U. of Minn., A.B., 1943, San Francisco City & Co. Hospital, San Francisco, Cal.

Anderson, Harold Clifford, U. of Minn., M.B., 1943, New Haven Hospital, New Haven, Conn.

Anderson, Horace Alfred, U. of Kansas, M.D., 1941, Mayo Clinic, Rochester, Minn.

Anderson, Richard William, U. of Minn., M.B., 1943, U. S. Marine Hospital, Seattle, Wash.

Anderson, Warren Rouvel, U. of Minn., M.B., 1942, Cambridge, Minn.

Anderson, William Theodore, U. of Minn., M.B., 1943, St. Luke's Hospital, Duluth, Minn.

Batdorf, B. Niles, U. of Minn., M.B., 1942, Mpls. General Hospital, Minneapolis, Minn.

Bennett, James Gordon, Harvard U., M.D., 1939, Mayo Clinic, Rochester, Minn.

Blake, Paul Swenson, U. of Minn., M.B., 1943, University Hospital, Minneapolis, Minn.

Carlisle, Joseph Dyer, U. of Minn., M.B., 1942, 32 Queen Ave. S., Minneapolis, Minn.

Carlson, Catherine Dorothy, U. of Minn., M.B., 1943, N. Y. Infirmary for Women & Children, New York, N. Y.

Chadbourn, Wayne Alfred, U. of Minn., M.B., 1943, U. S. Navy Hospital, Seattle, Wash.

Christensen, Llewellyn Eckhoff, U. of Minn., M.B., 1943, Detroit Receiving Hosp., Detroit, Mich.

Cohen, Ellis Nahum, U. of Minn., M.B., 1943, Detroit Receiving Hosp., Detroit, Mich.

Cooper, John P., U. of Minn., M.B., 1943, Good Samaritan Hospital, Los Angeles, Cal.

Corman, Morris D., U. of Minn., M.B., 1941, M.D., 1942, 317 14th Ave. S. E., Minneapolis, Minn.

Davis, George Richard, U. of Minn., M.B., 1943, Ancker Hospital, St. Paul, Minn.

Delmore, Robert Joseph, U. of Minn., M.B., 1943, St. Francis Hospital, Pittsburgh, Pa.

Devney, James William, U. of Minn., M.B., 1943, Cincinnati Gen. Hospital, Cincinnati, Ohio.

Dixon, Frank James, Jr., U. of Minn., M.B., 1943, U. S. Navy Hospital, Great Lakes, Ill.

Edwards, Lloyd Gideon, U. of Minn, M.B., 1943, St. Joseph's Hospital, St. Paul, Minn.

Eilert, Mary Louise, U. of Minn., M.B., 1943, U. of Chicago Clinics, Chicago, Ill.

Englund, Elvin Frederick, U. of Minn., M.B., 1942, Mpls. Gen. Hospital, Minneapolis, Minn.

Felion, Arthur Joseph, Jr., U. of Minn., M.B., 1943, Wm. J. Seymour Hospital, Eloise, Mich.

Ferguson, Wilson Joseph, Washington U., M.D., 1941, Mayo Clinic, Rochester, Minn.

Frey, William Burton, U. of Minn., M.B., 1943, Milwaukee Hospital, Milwaukee, Wis.

Frykman, Howard Martin, U. of Minn., M.B., 1943, St. Mary's Hospital, Duluth, Minn.

Gilinsky, Irvin Lloyd, U. of Minn., M.B., 1943, San Diego Co. Hospital, San Diego, Cal.

Godwin, Bernard Eugene, U. of Minn., M.B., 1943, St. Elizabeth's Hospital, Wash., D. C.

Gridley, John Willis, U. of Minn., M.B., 1943, Miller Hospital, St. Paul, Minn.

Grogan, John Melby, U. of Minn., M.B., 1943, Kansas City, Gen. Hospital, Kansas City, Mo.

Hestenes, Erling Gerhard, U. of Minn., M.B., 1943, Ancker Hospital, St. Paul, Minn.

Johnson, Georgia L., U. of Minn., M.B., 1943, Milwaukee Co. Hospital, Wauwatosa, Wis.

Jorgens, Joseph, U. of Minn., M.B., 1943, Mpls. General Hospital, Minneapolis, Minn.

Kaster, John David, U. of Minn., M.B., 1943, Milwaukee Co. Hospital, Wauwatosa, Wis.

Knutson, Julian Roland Borck, U. of Minn., M.B., 1943, University Hospital, Minneapolis, Minn.

Larson, Kenneth R., U. of Minn., M.B., 1943, St. Joseph's Hospital, St. Paul, Minn.

Lytle, Francis Theodore, U. of Minn., M.B., 1943, Presbyterian Hospital, Chicago, Ill.

McGauvran, Theodore Edgar, U. of Manitoba, M.D., 1925, Marshall, Minn.

Magraw, Richard Mueller, U. of Minn., M.B., 1943, Ancker Hospital, St. Paul, Minn.

Moe, Allan Eugene, U. of Minn., M.B., 1943, University Hospital, Minneapolis, Minn.

Morgan, Loran Brown, U. of Minn., M.B., 1943, St. Luke's Hospital, Denver, Colo.

Moyer, John Burroughs, U. of Minn., M.B., 1943, Wm. J. Seymour Hospital, Eloise, Mich.

Nachtigal, Beatrice Kelber, U. of Minn., M.B., 1942, 63-50 Wetherole St., Rego Park, Queens, N. Y. City.

Navratil, Donald Raymond, U. of Minn., M.B., 1942, 520 Wash. Ave. S. E., Minneapolis, Minn.

Nelson, Bernette Genevieve, U. of Minn., M.B., 1943, Mpls. Gen. Hospital, Minneapolis, Minn.

Nelson, Bernice Antoinette, U. of Minn., M.B., 1943, Mpls. Gen. Hospital, Minneapolis, Minn.

Nelson, Carl Gilbert, U. of Minn., M.B., 1942, Mpls. Gen. Hospital, Minneapolis, Minn.

Neuenschwander, Harold Lawrence, U. of Minn., M.B., 1943, Wm. J. Seymour Hospital, Eloise, Mich.

Nolte, Mark Edward, U. of Minn., M.B., 1943, U. S. Navy Hospital, Seattle, Wash.

O'Malley, Valentine, U. of Minn., M.B., 1943, Milwaukee Co. Hospital, Wauwatosa, Wis.

Olson, Albert Jarl, U. of Minn., M.B., 1943, San Francisco Co. Hosp., San Francisco, Cal.

Olson, Carlton Kent, U. of Minn., M.B., 1943, Mpls. Gen. Hospital, Minneapolis, Minn.

Pennington, Mary Helen, U. of Minn., M.B., 1943, Detroit Receiving Hosp., Detroit, Mich.

Peterson, Elroy Russell, U. of Minn., M.B., 1943, New Haven Hospital, New Haven, Conn.

Pulford, James Hartman, U. of Minn., M.B., 1943, Detroit Receiving Hosp., Detroit, Mich.

Quist, Henry William, Jr., U. of Minn., M.B., 1943, Mpls. Gen. Hospital, Minneapolis, Minn.

Raths, Otto Nicholas, Jr., St. Louis U., M.D., 1942, 1171 Summit Ave., St. Paul, Minn.

Reid, James Wilson, U. of Minn., M.B., 1943, Miller Hospital, St. Paul, Minn.

Rice, Roberta Geraldine, U. of Minn., M.B., 1943, U. of Ill. Research & Educational Hospital, Chicago, Ill.

Riegel, Gordon Stannard, U. of Minn., M.B., 1943, Rochester Gen. Hospital, Rochester, New York.

Schoenberger, Paul Bernard, U. of Minn., M.B., 1943, Wm. J. Seymour Hospital, Eloise, Mich.

Skinner, Abbott, Harvard U., M.D., 1942, 1501 Summit Ave., St. Paul, Minn.

Skubi, Kazimer B., Rush Med. Col., M.D., 1940, University Hospital, Minneapolis, Minn.

Smith, Paul McLay, U. of Minn., M.B., 1943, Wilkes-Barre Gen. Hosp., Wilkes-Barre, Pa.

Sterner, Donald Carl, U. of Minn., M.B., 1943, Bethesda Hospital, St. Paul, Minn.

Ulvestad, Harold Sigurd, U. of Minn., M.B., 1943, Ancker Hospital, St. Paul, Minn.

By Reciprocity

Donoghue, Francis Edmund, Columbia U., M.D., 1940, Mayo Clinic, Rochester, Minn.

Garner, Fay Lorenzo, U. of Neb., M.D., 1942, Miller Hospital, St. Paul, Minn.

National Board of Medical Examiners

Dumais, Alcide Fernand, Boston U., M.D., 1940, Mayo Clinic, Rochester, Minn.

Hurley, Joseph Patrick, Tufts Col., M.D., 1940, Mayo Clinic, Rochester, Minn.

Physicians Licensed May 7, 1943

April Examination

Anderson, Franklin Carl, U. of Minn., M.B., 1942, 115 Third St., Cloquet, Minn.

Bianco, John James, Temple U., M.D., 1941, Mayo Clinic, Rochester, Minn.

Christensen, Norman Anton, Rush Med. Col., M.D., 1941, Mayo Clinic, Rochester, Minn.

Cluxton, Harley Ernest, Jr., Johns Hopkins, M.D., 1941, Mayo Clinic, Rochester, Minn.

Ellison, Adam Brown Curry, Rush Med. Col., M.D., 1941, Mayo Clinic, Rochester, Minn.

Fortner, Lucille Lanier, U. of Ore., M.D., 1940, Mayo Clinic, Rochester, Minn.

Giebink, Robert Rodger, U. of Minn., M.B., 1942, 4404 Harriet Ave., Minneapolis, Minn.

Hamm, Robert Snyder, Ohio State U., M.D., 1940 Mayo Clinic, Rochester, Minn.

Haugseth, Ellsworth Kenneth, U. of Minn., M.B., 1943, Twin Valley, Minn.

HOHM, THEODORE ARTHUR, U. of Chicago, M.D., 1941, Huron, S. Dak.

JOHNSON, FRANK WATERS, Rush Med. Col., M.D., 1942, 5610 Dorchester Ave., Chicago, Ill.

KEMPER, CLARENCE MCDANIEL, U. of Colo., M.D., 1941, Mayo Clinic, Rochester, Minn.

LARSON, KEITH DELMAR, Northwestern, M.B., 1940, M.D., 1941, Mayo Clinic, Rochester, Minn.

LOBITZ, WALTER CHARLES, JR., U. of Cincinnati, M.B., 1940, M.D., 1941, Mayo Clinic, Rochester, Minn.

MASON, EUGENE EDGAR, Baylor U., M.D., 1940, Mayo Clinic, Rochester, Minn.

MULTHAUF, CYRIL JOSEPH, Marquette U., M.D., 1941, Mayo Clinic, Rochester, Minn.

MURPHY, JACK TULLUS, Northwestern, M.D., 1942, Mayo Clinic, Rochester, Minn.

NOTIER, VICTOR ANTHONY, Rush Med. Col., M.D., 1941, Mayo Clinic, Rochester, Minn.

QUATTLEBAUM, FRANK WALTER, U. of Georgia, M.D., 1939, Mayo Clinic, Rochester, Minn.

ROGERS, JAMES DEL, Northwestern, M.B., 1941, M.D., 1942, Mayo Clinic, Rochester, Minn.

ROSENBLATT, HENRY DENNIS, U. of Minn., M.B., 1942, 809 Portland Ave., St. Paul, Minn.

SNIDER, GORDON GASKILL, U. of Ill., M.D., 1941, Mayo Clinic, Rochester, Minn.

STRATTE, JOHN JOSEPH, Rush Med. Col., M.D., 1942, Warren, Minn.

TAYLOR, DOUGLAS HAMILTON, U. of Ore., M.D., 1942, Mpls. Gen. Hospital, Minneapolis, Minn.

THOMES, ARTHUR BOYD, U. of Minn., M.B., 1942, University Hospital, Minneapolis, Minn.

TINKHAM, ROBERT GREY, U. of Minn., M.B., 1942, 25 Seymour Ave. S. E., Minneapolis, Minn.

TONGEN, LYLE AARON, Washington U., Mo., M.D., 1942, Walhalla, N. D.

WATSON, THEODORE, U. of Minn., M.B., 1943, Miller Hospital, St. Paul, Minn.

By Reciprocity

CALMENSON, MARVIN, Rush Med. Col., M.D., 1938, Mayo Clinic, Rochester, Minn.

JOHNSON, ALDRIDGE FRANCIS, U. of Ark., M.D., 1942, Greenwood, Ark.

LEVIN, JULES DARRELL, U. of Wis., M.D., 1938, University Hospital, Minneapolis, Minn.

MURDOCH, JAMES WILLIAM, JR., U. of Neb., M.D., 1942, 826 S. 36th, Lincoln, Neb.

National Board of Medical Examiners

TICE, ARNOLD, U. of Iowa, M.D., 1941, Mayo Clinic, Rochester, Minn.

Physicians Licensed July 17, 1943

June Examination

BOOREN, JACK CARLETON, U. of Minn., M.B., 1943, St. Mary's Hospital, Duluth, Minn.

BURKLUND, EDWIN CARL, Northwestern, M.B., 1942, M.D., 1943, 1000 University Ave. S. E., Minneapolis, Minn.

COLBERG, ARTHUR J., U. of Minn., M.B., 1922, M.D., 1923, 2343 Carter Ave., St. Paul, Minn.

CONLEY, ROBERT HANTEN, U. of Minn., M.B., 1942, M.D., 1943, Watertown, S. Dakota.

COULTER, HAROLD EUGENE, U. of Minn, M.B., 1942, M.D., 1943, Lamberton, Minn.

FLYNN, BERNARD FRANCIS, Loyola U., M.D., 1943, 2117 6th Ave. E., Hibbing, Minn.

GAARDE, FREDERIC WILLIAM, JR., U. of Minn., M.B., 1942, M.D., 1943, 718 5th St. S. W., Rochester, Minn.

GALLIGAN, MARGARET MARY DURKIN, U. of Minn., M.B., 1942, M.D., 1943, 1910 Franklin Ave. S.E., Minneapolis, Minn.

GEURS, BENJAMIN R., U. of Minn., M.B., 1942, M.D., 1943, Hamel, Minn.

HORNS, RICHARD COBURN, U. of Minn., M.B., 1942, University Hospital, Minneapolis, Minn.

IDE, ARTHUR WHEATON, JR., U. of Mich., M.D., 1943, Ancker Hospital, St. Paul, Minn.

KAPLAN, HAROLD ARTHUR, U. of Minn., M.B., 1943, Ancker Hospital, St. Paul, Minn.

KERN, CARROLL E., Indiana U., M.D., 1940, Mayo Clinic, Rochester, Minn.

KIRKLIN, JOHN WEBSTER, Harvard U., M.D., 1942, 1104 7th St. S. W., Rochester, Minn.

LICK, WILLIAM JOSEPH, JR., U. of Minn., M.B., 1942, 587 Dayton Ave., St. Paul, Minn.

LOFGREN, KARL ADOLPH, Harvard U., M.D., 1941, Mayo Clinic, Rochester, Minn.

LUCKEMEYER, CARL JOSEPH, Marquette U., M.D., 1943, St. Mary's Hospital, Duluth, Minn.

LUND, CURTIS JOSEPH, U. of Wis., M.D., 1935, University Hospital, Minneapolis, Minn.

MCCARTHY, AUSTIN MICHAEL, U. of Minn., M.B., 1942, Mpls. Gen. Hospital, Minneapolis, Minn.

MICHELS, ROGER P., U. of Minn., M.B., 1942, M.D., 1943, 801 Becker Ave. W., Willmar, Minn.

MILNAR, FRANK JOSEPH, Marquette U., M.D., 1942, 412 Otis Ave., St. Paul, Minn.

NEANDER, JOHN FREDERICK, U. of Minn., M.B., 1943, 1242 Earl St., St. Paul, Minn.

PADGETT, HAROLD OWEN, Baylor U., M.D., 1939, Mayo Clinic, Rochester, Minn.

POORE, THOMAS NELSON, U. of Minn., M.B., 1943, St. Mary's Hospital, Duluth, Minn.

RINEHART, ROBERT EARL, U. of Oregon, M.D., 1942, Mayo Clinic, Rochester, Minn.

RIVES, HUGH FARRAR, U. of Arkansas, M.D., 1938, Mayo Clinic, Rochester, Minn.

ROTH, ROBERT RUSSELL, U. of Illinois, M.D., 1941, Mayo Clinic, Rochester, Minn.

SCHULZE, JOHN WILLIAM, U. of Minn., M.B., 1942, M. D., 1943, Hutchinson, Minn.

SHONYO, ELWYN S., Rush Med. Col., M.D., 1937, Mayo Clinic, Rochester, Minn.

TROXIL, ELIZABETH B., U. of Minn., M.B., 1943, Mpls. Gen. Hospital, Minneapolis, Minn.

VIGELAND, GEORGE NORMAN, Northwestern U., M.B., 1941, M.D., 1942, 628 Grand Ave., St. Paul, Minn.

WHELAN, JOSEPH L., U. of Minn., M.B., 1942, M.D., 1943, 20 First St. S. W., Chisholm, Minn.

WHITLOCK, GERALD FREDERICK, Washington U., Mo., M.D., 1941, Mayo Clinic, Rochester, Minn.

By Reciprocity

BAIRD, JOE WILLIAM, U. of Neb., M.D., 1930, Mayo Clinic, Rochester, Minn.

WESTPHAL, KEAN F., Northwestern U., M.B., 1937, M.D., 1938, 1947 Grand Ave., St. Paul, Minn.

National Board of Medical Examiners

BAKER, MILTON ERNEST, Northwestern U., M.B., 1942, M.D., 1943, 2284 W. Lake of Isles Blvd., Minneapolis, Minn.

CHRISTOPHERSON, JOSEPH ELMER, U. of Minn., M.B., 1942, M.D., 1943, 812 5th Ave S., Virginia, Minn.

MINNESOTA STATE MEDICAL ASSOCIATION

Ninetieth Annual Session

May 16, 17, 18, 19, 1943

Hotel Radisson

Minneapolis, Minnesota

(Continued from September issue.)

The Speaker then called for the report of the Reference Committee on Medical Economic Reports, Dr. R. W. Morse, Chairman. The following reports were considered:

EDITING AND PUBLISHING COMMITTEE

Herewith is a copy of the financial status of MINNESOTA MEDICINE from January 1 through December 31, 1942. The State Medical Association will be interested to know that the amount of cash income from MINNESOTA MEDICINE during the past year has been the largest during the twenty-five years of its publication. Just what the profits for the coming year will be is uncertain because of the increased cost of publication, wage increases, et cetera.

Furthermore, through the efforts of our Editor, Dr. Carl B. Drake, and Mr. J. R. Bruce, the Silver Anniversary Journal published in January was an outstanding publication and very pleasing reports have been received from many sources regarding it. One very interesting letter came from Dr. William C. Gibson of the R.C.A.F., Regina, Sask., in which he states:

"Enclosed is a money order for $1.20 (U. S. funds) for which please send me three (3) copies of your 25th Anniversary Issue, January, 1943. This is one of the finest anniversary numbers of any journal which I have seen."

E. M. HAMMES, M.D., *Chairman*

MINNESOTA MEDICINE
CASH RECEIPTS AND DISBURSEMENTS

January 1, 1942, through December 31, 1942

SOURCE OF CASH RECEIPTS:		
Display Advertising	$10,570.63	
Member Subscriptions	5,065.36	
Non-member Subscriptions	489.09	
Illustrations	18.96	
Miscellaneous Income	10.57	
Reprint Income	115.95	
Bad Accounts Recovered	2.70	
Gross Cash Receipts	$16,273.26	
Less:		
Discounts and Commissions		
Advertising $1,513.13		
Subscriptions 16.20		
	1,529.33	
Net Cash Receipts		$14,743.93
CASH DISBURSEMENTS		
Journal Expense		$12,826.57
Cash Surplus for Period		$ 1,917.36
Accounts Receivable January 1, 1942		$ 909.03
Accounts Receivable December 31, 1942		$ 846.38

MINNESOTA MEDICINE
STATEMENT OF INCOME AND EXPENSE AND PROFIT AND LOSS

For the Period

January 1, 1942, through December 31, 1942

ACCRUAL BASIS

Income		
Display Advertising	$10,520.89	
Member Subscriptions	5,065.36	
Non-member Subscriptions	489.09	
Illustrations	18.96	
Miscellaneous Income	10.57	
Reprint Income	103.04	
Bad Accounts Recovered	2.70	
		$16,210.61
Expense		
Journal Expense (See Schedule A)	$ 12,826.57	
Discounts and Commissions:		
Advertising	1,513.13	
Subscriptions	16.20	
		$14,355.90
Profit for the Period		$ 1,854.71

MINNESOTA MEDICINE
SCHEDULE A

JOURNAL EXPENSE

Printing Expense—includes composition, presswork and bindery expense	$ 6,419.98
Paper Stock	1,294.36
Illustrations	424.35
Dr. Carl B. Drake—Editorial Fee	1,200.00
Second class postage and postage used on Minneapolis and foreign copies	367.20
Mailing Envelopes (Used for sending out advertisers' copies)	23.30
Bruce Publishing Company Service Fee (Covers business management, stenographic service, mechanical editing of all material, ordering all cuts, making up dummy, mailing out all proofs, bookkeeping, billing and collecting all accounts, keeping up mailing lists, et cetera)	1,680.00
Bruce Publishing Company (Covers telephone, telegrams, addressograph plates, et cetera)	132.00
Advertising Commission (Includes 5 per cent received from advertising placed through the C.M.A.B.)	1,212.76
Copyright Fee	24.00
Bond—J. R. Bruce, Business Mgr.	5.00
AMA Directory	15.00
Science News Subscription	7.00
Exchange on checks	3.02
Stationery	18.60
	$12,826.57

COMMITTEE ON CONTRACT PRACTICE

The Committee has had no meetings during the year.

There has been no business referred to the Committee during the year.

At the present time your committee does not know of any instances of infractions apt to be referred to it for consideration in the near future.

F. A. OLSON, M.D., *Chairman*

MEDICAL ADVISORY COMMITTEE

Again, during this past year it has not been necessary to call a meeting of the entire Committee. Numerous reports of malpractice suits threatened or started have been received by the Chairman and these reports have been studied and in cases where it was advisable, contact has been made with the Insurer and advice given in individual cases. Also, other material pertinent to malpractice cases pending has been reviewed from time to time by the Chairman at the request of the Insurer and an opinion rendered as to the best method of handling the case.

It is a pleasure to state that the number of threatened malpractice suits, as well as those instituted, has been definitely less during the past year. There may have been cases not called to our attention, but the number of those that have been called to our attention is less than at any time since I have been Chairman of this Committee.

W. H. HENGSTLER, M.D., *Chairman*

COMMITTEE ON MEDICAL ECONOMICS

The high wages of wartime have made the purely economic phase of medical practice somewhat simpler than in former years.

For that reason, the immediate problem of medicine lies in the sphere of providing adequate services rather than in the sphere of paying for them.

It is gravely concerned, also, with the serious threat of hasty and unwise emergency legislation and federal directives designed to meet the "doctor shortage."

It will be easy, in the face of wartime pressures, to sacrifice such fundamentals as free choice of physician and high standards of medical licensure to temporary demands. It will be difficult, if not impossible, to undo such capitulations to pressure after the war is over.

The problem of organized medicine in America is therefore to see that everybody everywhere is supplied with the essentials of medical service. Only thus will the independence of medicine and its high standards of education and practice emerge from the conflict. Largely, of course, that is a national even more than it is a state problem.

There is every indication that organized medicine in Minnesota is doing its job well in spite of the fact that no county or state organization here has undertaken as yet any experimental

plans of prepayment for medical services, except for a Farm Security Medical plan in one small area.

Experience of other states, as noted in the report of our active and alert Committee on Sickness Insurance, has not been altogether happy. If insurance medicine is really to be the pattern of the future, as many profess to believe, the exact formula has certainly not been evolved as yet.

That Minnesota has not embarked upon medically sponsored insurance ventures does not mean, of course, that we are not well in advance in this state in our smoothly functioning and well-conceived plan for provision of medical care to recipients of relief and Social Security aids. Here, indeed, we have developed patterns which are envied and copied elsewhere. Many problems still remain to be solved in this phase of our service, to be sure; but the ground work is laid that will meet not merely immediate needs but the probable burdens of the future when war wages are a thing of the past and relief rolls again become grevious and overwhelming.

In our expansion of hospital insurance, too, Minnesota is in the vanguard among the majority of states. Hospital insurance has provided a practical and effective answer to the most burdensome costs of illness and, in this state, is becoming available to larger and larger numbers of people in the rural districts as well as in the cities.

The actual work of the Economics Committee is carried forward by its subcommittees to which the various phases of economic and social relationships of the profession in Minnesota are assigned. The excellent work of these committees during the past year will be discovered in the reports of the various chairmen.

The editorial phase of the work has continued as usual in the Medical Economics section of Minnesota Medicine. The object of the Editorial Subcommittee in charge of this section has been to keep the membership informed, not only of what is going on in Minnesota, but of significant events and experiences in other states. Its success may be measured by its reader-interest which appears to be considerable, not only here hut elsewhere. This section could well become a forum of opinion for all physicians in the state.

Scientific medicine has been and always will be the primary study and purpose of organized medicine. However in these modern, complex times, it is recognized that all phases of our social economy—industrial, political, insurance—will increasingly affect it. Certainly, the future welfare of scientific medicine will be dependent upon the wise handling by the government, the public and the doctor of the economic phases involved.

In the year ahead and in the difficulties which await us all when the war is over, a strong central medical organization is obviously our mainstay. It must be supported, if we are to continue in our role of enlightened coöperation with state agencies and allied professions, for maintenance of good medical service to our people and high standards in our profession.

George Earl, M.D., *Chairman*

COMMITTEE ON LOW INCOME AND INDIGENT PROBLEMS

Medical services to relief clients and recipients of Social Security Aids are now on a sound basis in Minnesota. They are administered, for the most part, without friction or unfairness.

The State Medical Advisory Committee continues to meet regularly with the Division of Social Welfare and all regulations involving medical service are approved by that Committee before they are released to the County Welfare Boards. Mr. Bernard LeVander, new Director of the Division, has given assurance that the policies and procedures established under the direction of his predecessor, Mr. Walter Finke, will be continued.

One source of long-standing difficulty should be eliminated soon as a result of a recent ruling by the Attorney General. At the request of Senator Stiening of Moorhead, the Attorney General gave it as his opinion that the local political suhdivision, whether it is the county, township, village or city, is liable for medical care, including hospitalization, to recipients of relief or Social Security Aids whenever the recipient is unable to pay for it out of his Old Age Assistance grant. The complete correspondence between Senator Stiening and the Attorney General on this important matter will be published soon in Minnesota Medicine.

Two experiments with prepayment plans for clients of the Farm Security Administration are now in their second year in Minnesota. Ottertail and Morrison counties were selected for these experiments with the approval of the physicians of the two counties as well as this Committee and the Council. Both plans have now been in existence a long enough time for reports of their experience to be significant. They are summarized briefly below.

In Ottertail County: According to Dr. W. O. B. Nelson, Secretary of the Park Region District and County Medical Society, the annual premium paid by each family is not sufficient to supply adequate medical service. It should be raised from the present rate of $23.00 to $30.00 or more a year.

Because funds are lacking physicians' fees under the plan in Ottertail County are frequently reduced to about sixty per cent of the regular relief fee schedule which is, in itself, about one-third lower than the normal fee.

Most participating physicians feel that they are better off even with this reduction, Dr. Nelson reports, however, than they were formerly. The reason is that many of the Ottertail families receiving FSA aid are and have been for some time almost destitute. Without this aid they would be unable to pay any medical fees at all. A physicians' committee audits all bills under the plan, Dr. Nelson reports. Participating families are not, so far, abusing the plan.

In Morrison County: Less than fifty per cent of the families who participated during the first year in the Morrison County plan entered it for the second year, Dr. E. J. Simons of Swanville reported. Change in FSA personnel was given as the reason for this significant dwindling of subscribers; but the Morrison County Medical Club went on record to the effect that two-thirds of all eligible families in any group would have to subscribe to assure success for the plan. Also that, unless there was a minimum of at least 100 families, the plan would be headed for failure.

"At the end of the first year of operation in Morrison County, 65.8 per cent of the current medical fees had been paid for care of subscriber-families," Dr. Simons said, "in contrast to 66⅔ per cent which is paid for care of actual indigents by the County Welfare Board. Out of the total 450 FSA families, 219 subscribed the first year. For the remaining 231 families, however, $400.00 worth of care was given for which only 50 per cent was paid to the physicians who gave the care."

Thus Morrison County physicians, as a whole, expressed satisfaction with the plan during the first year but have been less satisfied during the first seven months of the current year. A smaller percentage of fees has been paid and the plan has not operated as smoothly as previously.

It is quite probable, with increased demand and higher pay for farm workers, not to speak of the possibility that all Farm Security Administration funds may he withdrawn, that the medical program of FSA may soon lapse entirely. In any case, the fact that the plan lost instead of gained subscribers in Morrison County is significant.

No other proposals for easing medical costs for low income groups have been presented this year and the probability is, what with wartime work and wages, that few such proposals will gain any popular support for the duration.

W. A. Coventry, M.D., *Chairman*

COMMITTEE ON MEDICAL ETHICS

One instance of unethical advertising was brought to the attention of the Committee on Medical Ethics in August, 1942. The action of the Committee was that the practices in this instance were unethical and appropriate action hy the State Association was recommended.

Robert D. Mussey, M.D., *Chairman*

COMMITTEE ON SICKNESS INSURANCE

The members of the Sickness Insurance Committee have been very active in following and studying the various prepayment plans for sickness insurance. However, they all agree that the state association should not initiate any state-wide plan at this time for several reasons.

In the first place, the need for such a plan has diminished with the improvement of economic situations due to the scarcity of labor. Secondly, the initiation of such a plan to meet the demands of various communities is a major undertaking and has not worked too satisfactorily in states in which it is employed, for it is apparent that a state-wide plan would require the cooperation of all physicians if the plan is to work successfully. Furthermore, states now employing prepayment insurance plans are having difficulties in selling the plan, and there is considerable indecision as to whether or not the plans should be sold independently or with the Hospital Service Contract. Some groups prefer a complete medical service plan rather than the limited service plan, but when such is done, the expense is greater than most of the recipients wish to pay. Too often patients who can afford the service of a private physician desire the prepayment contract when it was originally designed for those with lower incomes.

Members of the Ramsey County Medical Society have been interested in working out a prepayment plan, but they too feel that the need for such a plan has been decreased with the general improvement of the economic situation, and, therefore they have allowed their plans to lie dormant. It is well to state here that should any plan be initiated by a county group or a state group, it would be necessary to secure an enabling act before such a plan could be put into operation. A corporation would likewise have to be effected prior to the issuing of sickness insurance contracts.

The Group Health, originated by the credit unions within the state, is now writing a group medical policy under the incorporation of Group Health Mutual which is worthy of consideration since their new policy provides for the free choice of physician rather than the insistence of its participants' consulting only physicians of a medical group. Furthermore, their policy, though a limited benefit policy, specifies that the settlement will be in cash, paid directly to the physician.

During the several meetings held in Chicago in the middle of February, 1943, various representatives of prepayment insurance plans concluded that some sort of an organization should be formed in order that experiences and reports of the various operations of plans could be exchanged and made available to groups considering the introduction of prepayment medical insurance.

Dr. O. I. Sohlberg of Saint Paul, Dr. W. A. Coventry of Duluth, and Dr. A. W. Adson of Rochester were invited to attend a meeting at the Palmer House in Chicago for this purpose.

At this meeting, it was decided that medical service plans organized with the approval of constitutent medical organizations of the American and Canadian Medical Associations would hold an Annual Conference at the time of the annual House of Delegates Meeting of the American Medical Association, and that active medical service plans organized by constituent medical organizations of the American Medical Association and the Canadian Medical Association form a Medical Service Plans Council.

McCann of Massachusetts was voted President; Feierabend of Kansas City, Mo., Secretary-Treasurer, and a Committee was appointed to act as a group to provide coöperation between the American Medical Association, the Canadian Medical Association and the Medical Service Plans Council, including the following members: Palmer, of Pennsylvania, Chairman; Hannah of Toronto, Member; Novy of Michigan, Member; and Mr. Jack Laux, Director of Michigan Medical Service, was named Research Director.

It was then agreed to make Kansas City, Missouri, the National Headquarters of the Council, and the Secretary was instructed to ask all Plans in operation to contribute $25.00 annually. (They likewise would appreciate donations of $25.00 per year from such groups who wished to receive data from this Committee as an aid in organizing similar committees in order to defray some of the expenses in connection with research problems and the collection of statistical data.)

It was agreed that this was merely a temporary plan until such time as various member plans agree to provide the necessary income by a different procedure.

The function of the Medical Service Plans Council is to correlate all facts, both good and bad, and to make this information available to any constituent medical organizations of the American Medical Association and the Canadian Medical Association. All of this information will then be submitted to Mr. Jack Laux, Research Director, who is to work with J. A. Hannah, M.D., Managing Director of the Associated Medical Services, Inc., of Toronto. Dr. Hannah has volunteered for this enormous undertaking.

It is our opinion that much will be accomplished by exchanging ideas, collecting data, and crystallizing results of the various plans through this new council on prepayment medical service, and we have therefore been granted permission by our Council to attend its meetings and pay the $25 asked for its support.

The Committee has also watched with interest the experiment of prepayment medical service now being conducted in two counties within our own state under the farm security plan, in which attempts are made to rehabilitate farm families.

Though your committee has not taken an active part in proposing or initiating a prepayment medical service plan, it has been collecting information and data on plans and operations. This material is on file in the state office and is available for groups considering the development of prepayment medical service. The committee is also willing to offer its advice to any group proposing such an enterprise.

A. W. Adson, M.D., *Chairman*

Doctor Morse: The report of the Editing and Publishing Committee was carefully examined and checked and found to be satisfactory. The committee feels we owe a great deal to Dr. C. B. Drake and to the Editing and Publishing Committee of which Dr. E. M. Hammes is Chairman for their achievement in publishing such an outstanding Journal. We recommend adoption, also, of the Report of the Committee on Contract Practice of which Dr. F. A. Olson is Chairman and of the Medical Advisory Committee of which Dr. W. H. Hengstler is Chairman. The latter report shows a definite decrease in malpractice suits and in threatened malpractice suits in the last year. We feel that this decrease is due to a great extent to the work of this committee and recommend its acceptance.

The report of the Committee on Medical Economics of which Dr. George Earl of St. Paul is Chairman is very comprehnsive and we recommend it to be read in full by each delegate. It shows that his committee is fully conversant with all problems in economics which face our profession.

The committee believes we should continue to study the many insurance plans sponsored by the various states. From these we may eventually be able to decide wisely whether or not we wish to sponsor any insurance plan for medical service. We wish to stress, also, the importance of the Medical Economics section of Minnesota Medicine, to recommend that the work of this important editorial subcommittee be continued and to express our thanks for a job well done.

Dr. W. A. Coventry, in the report of the Committee on Low Income and Indigent Problems, reports that medical service to relief clients and recipients of Social Security Aids are now on a sound basis in Minnesota. Also that a recent opinion of the Attorney General of the state places responsibility for payment of costs of last illness for Old Age Assistance recipients on the local township, county, village or city. You are urged to study this opinion when it is published in Minnesota Medicine.

The report of experience with a Farm Security Administration plan in Ottertail and Morrison Counties shows that, so far, this experiment has not been an unqualified success. This committee and the Committee on Sickness Insurance are commended for their work. We believe that both should be continued. Also the Committee on Medical Ethics which reported one case of unethical advertising in the state in which appropriate action was taken.

The Speaker then called for five-minute discussions by chairmen of the above committees and subcommittees. Dr. George Earl responded.

Doctor Earl: I do want to call your attention to the work of the important subcommittees of the Medical Economics groups. These men have done the real work on the Medical Economics Committee and they have done a wonderful job. I want to commend them and give credit where credit belongs.

It was moved, seconded and carried that the report of the Reference Committee on Medical Economics Reports be accepted.

The Speaker then called for new business and Dr. Burnap presented the amendment to the By-Laws, Chapter 5, Section 11, (See Page 819, September issue) and asked Dr. L. A. Buie, Chairman of the Finance Committee, to explain the reason for the amendment.

Doctor Buie: The reason why it has been necessary to bring your attention to this modification in the Constitution and By-Laws is that no provision has been made whereby it is possible for us to sell any of our holdings. This amendment is intended only to cover that discrepancy. We can buy stocks, we can buy bonds; but if we want to dispose of any holdings it will be necessary to adopt this amendment.

Doctor Morse: I gather that the amendment is not designed to enable the Committee to sell all present holdings for reinvestment but only to sell when it is advisable. In that case, I think it is a wise provision.

Doctor Buie: It is intended so that we can do business. Any stock we buy is going to be recommended by everybody we come in contact with who knows market values; but without this provision our ability to handle them is obstructed. For example, I might mention that we have now $5,000 in the Century Trust Company. This is an investment trust company which diversifies stocks. But your committee and its advisors feel that $5,000 is too much money to have in one company of that kind and we would like to sell half of that stock and take care of that much of the diversification ourselves. When we tried to do that we found that, under trust company requirements, we would have to have signatures of everybody on the Council and a certified copy of the Council action, almost a photograph and finger prints of everybody connected with the transaction. We need a better arrangement and this amendment seems to be the simplest way of achieving it. It has been carefully gone over by Mr. Manley Brist and Mr. Rider of the First National Trust Company of Minneapolis and everybody is agreed that it is a skillful and correct way of handling the matter. As I have said before, you can count on it that we are not going to take any chances. As a matter of fact, we ourselves would rather not be in on it at all because, I think everybody will agree, we have not only accepted a position of trust but we are vulnerable if anything should go wrong in the future.

Doctor Burnap: I just want to add something. You should know that it is not an accident that first Dr. Giffin, here, was Chairman of the Finance Committee and that after he retired, Dr. Buie took the job. The Mayo Clinic is very generous in business as well as scientific matters. They invest more than the State So-

ciety and we have the advice of their business counsel as well as the best advice in the Twin Cities. When Dr. Buie took the job he said, "I know nothing about this business but I will try to find out." He is finding out.

The Speaker asked for a motion on the amendment, explaining that according to the Constitution and By-Laws, the motion would have to lie over a day before final action was taken.

It was moved, seconded and carried that the amendment be accepted for final action the next day.

It was also moved, seconded and carried that Dr. Kathleen Jordan of Granite Falls, wife of L. S. Jordan, superintendent of the Riverside Sanatorium, who has for some time given her services without pay in public health work in the state, be given an Associate Membership in the Association. Dr. Jordan is not engaged in private practice of medicine.

The meeting adjourned until 7:30 p.m.

SUNDAY EVENING SESSION

The Speaker called on Dr. Piper for the substitute report of the Reference Committee on Lay Education Reports.

Doctor Piper: We recommend adoption of the report of the Committee on Public Health Education and wish to call attention to the subject of conservation of hearing. We feel that this program should be fostered. In reference to the Committee on Tuberculosis which is mentioned in the report, we feel that the distinction between the Minnesota Public Health Association and the Minnesota State Medical Association should be clarified by an article in a medium such as Minnesota Medicine. Furthermore, the Reference Committee feels that the Minnesota Public Health Association should be encouraged to give wider publicity in local newspapers to its activities in public health and that an annual financial statement of receipts and expenditures of local units would stimulate public interest and encourage the sale of Christmas Seals.

It was moved, seconded and carried that the report be accepted.

The Speaker then called on Dr. J. C. McKinley for a report from the Minnesota State Board of Examiners in the Basic Sciences.

Doctor McKinley: I am sure you are all acquainted with the functions of the Basic Science Board. It is the bottleneck through which all individuals who want a charter to practice the healing arts in Minnesota must pass. We examine in the basic sciences, as determined by the Basic Science Law, including anatomy, physiology, physiological chemistry, pathology, bacteriology, and hygiene. Since the Board was established in 1927, a total of 3,182 individuals have applied for basic science certificates. Of these, 3,043 have passed the examination, leaving 139, or a percentage of 4.3, as failures. Under our law we accept people by reciprocity, also, and after passing the examination of the National Board of Medical Examiners. We have reciprocity with only eight of the 17 basic science states in the country. They are Arkansas, Colorado, Michigan, Nebraska, Oklahoma, Oregon, South Dakota and Wisconsin. Formerly we had reciprocity, also, with Iowa but that was broken off in October, 1942.

There are about 4,000 licensed practitioners of medicine in the State. There are 162 osteopaths and 378 chiropractors licensed to practice in Minnesota. Twenty-four of these osteopaths and forty-two of the chiropractors live outside the state.

We have given examinations four times a year routinely until the last year, when we have been giving interim examinations in order to clear the status of candidates as promptly as possible. We discovered in 1939 that a good many people were failing again and again. They were allowed under the law to repeat three times during a year, after which they could reapply and take the whole examination over again. Some had come in for examination four consecutive times and failed completely each time. After some experimentation, the Board ruled that an individual who failed part of the examination could make up the failures during the calendar year. If he failed to do so, he could take the whole examination again but only after lapse of a year. And this time he would have to take the examination in one sitting and pass five out of six subjects. Different techniques are used by different state boards in handling papers. Some, as in Minnesota, are extremely careful to hide the identity of the individuals taking the examination so that there is absolute impartiality in marking the papers. Others recognize the identity of individuals from start to finish. Some have gone so far as to demand to be allowed to regrade papers of applicants for reciprocity from other states, if regulations as to grade of passing is different from their own. We have not felt that such a practice was either legal or desirable in Minnesota.

The Speaker then called on Dr. J. F. DuBois, Secretary of the Minnesota State Board of Medical Examiners, whose report was not recorded. Following Dr. DuBois' report, he called on Dr. W. F. Braasch, Chairman of the State Committee on Procurement and Assignment.

Doctor Braasch: A great deal of water has gone over the dam since I gave my report last year and things have changed materially. I am here to say, however, that last year's session clarified the atmosphere wonderfully and the men of this state have coöperated to a remarkable extent. As a result, the State of Minnesota filled its quota for 1942 by 105 per cent, a record of which we can well be proud.

Achieving that record, of course, meant a lot of hard work and sacrifice and it should be noted that many men volunteered for service who were not permitted to leave their jobs at home. The medical recruiting officers who were temporarily in the field, here and elsewhere, assisted materially. But they did not achieve the full objective planned for them because a large portion of the work was done by the State Committee and its seven sections, representatives from these sections being, Dr. G. L. Gosslee of Moorhead; Dr. J. A. Thabes of Brainerd; Dr. A. N. Collins of Duluth; Dr. R. C. Hunt of Fairmont; Dr. A. E. MacDonald of Minneapolis; Dr. L. E. Daugherty of St. Paul; and I, myself, for my section of the state. In addition there were chairmen in each county and district. These latter worked well and deserve a lot of credit they never got. I must mention, particularly, the work of Dr. Erling Hansen of Hennepin County and Dr. J. S. Abbott of Ramsey County. Of course, any credit which goes to the committee as a whole must start with Mr. Rosell, the Executive Secretary, and his able associates. It is owing to them that the work was really put across. Mr. Rosell with his knowledge of the men and the geography of the state was invaluable to our service. In case of any doubt, he went out personally to investigate the situation and to find a satisfactory solution.

We have had our difficulties, as you can well imagine, but I believe there are few communities, very few, that are not provided with satisfactory medical service. Of course there have been complications. For instance, some of the older men, who were left to take up the burden of practice, have cracked under the strain and the whole burden has fallen on the few young men remaining. We have had difficulties in inducing other men to take up practice in such communities under the circumstances. Allocation is made difficult, sometimes, also, because men have their own problems and their own ideas and we have had no legal right to force them. There have been complaints, some of them from delegations of citizens, who objected to the release of physicians in their communities for war service. In

many cases, their complaints were justified. In others we could not agree and here Mr. Rosell helped to find a solution.. We were especially aided by a survey of the state made by Mr. Rosell's office, showing where men could be spared.

At this time there are 1,221 physicians who were residents of Minnesota and are now in active or inactive service. Of these 1,130 are in active service today, which, as you can see, is a large proportion of our men. In 1941 there were approximately 3,335 doctors registered in the state. Today there are 2,497, of whom 249 are retired from practice, and approximately 345 are sixty-five years old and older but still in practice. These men are considered by Washington to be only one-third efficient—many of you will resent that, perhaps.

The Mayo Clinic at Rochester has 445 physicians but only about one-third of the work done there is for people of Minnesota and so two-thirds of that number have been deducted from the number serving the population of the State. On the above figures, the conclusion is that only 1,429 are in actual practice here taking care of Minnesota people, and the ratio to population is therefore approximately one to 1,650 for the state as a whole. At the present time, 257 more physicians have been made available by the State Committee and that number will probably fall short of the quota sent to us from Washington for 1943. Since, from past experience, we know that one-third will be disqualified for physical and other reasons, you can see that we are skating on thin ice here so far as future physicians for the Armed Forces are concerned. The actual quota for 1943 has been variously stated. At one time it was 354; but that figure has been changed and we do not know definitely the figure to be expected from Minnesota this year. The Central Committee has reported that there are 11,500 physicians available from the country at large for the Armed Forces in 1943. The committee figures also on 4,000 to 5,000 interns and residents, making a total of approximately 15,000 men who might be available in the country in addition to the 42,000 who were in the service at the first of the year. There are 14 states who went way over the required quota for last year and are exempt from further demands for the present. Fifteen other states were called upon for only 100. The states of New York, Pennsylvania, Illinois, Massachusetts and California were below their quotas and are expected to take up the main burden, particularly the large centers in those states. In Minnesota, the rural districts are pretty well stripped of available physicians. There are a few men here and there who are available and have not been patriotic enough to apply for commissions but they are very few. That means that our needs will have to be met largely by men in the Twin Cities, with a few from Duluth and the larger towns and Rochester. It was agreed at a meeting held here recently with representatives of the Central Board that additional effort would be made in the future among men from Hennepin and Ramsey Counties. The system employed at present is as follows: The State Committees submit monthly lists of available physicians in their states to the Central Office in Washington. Letters are sent direct from Washington to the physicians listed, requesting them to apply for commissions and asking them to inform state chairmen of their preference as to branches of service. The chairman, in turn, sends the names to the officer procurement offices of their choice. Application forms are sent direct to the physicians from various officer procurement offices. If the physician does not respond it is the responsibility of State Procurement and Assignment Committee, in cooperation with the local medical society, to do everything possible to see that he accepts the assignment. That means, of course, that a personal effort to persuade available Twin City men especially to apply will be made.

As you know, the ratio of physicians to soldiers has been materially reduced here though it is still much higher than the ratio in European Armies. Whether it can be reduced below present levels is open to question and an aroused public opinion will probably have something to do with future policies. As a result of the Pepper investigation in the Senate and other agitation there is a definite demand that enough physicians be kept at home to take care of community health. The Procurement and Assignment Service was involved in the criticism but it is now generally recognized that Procurement and Assignment has done a good job of safeguarding civilian interests. Certain special national problems have arisen which presented acute difficulties, such as medical service for boom towns and new industrial areas. Many of these special problems are being taken care of satisfactorily now by the local medical societies involved and by the Public Health Service which should be given credit for coöperating closely in most areas with organized medicine. I should like to say, also, that the War Manpower Commission with Mr. Paul McNutt at the head has supported the Procurement and Assignment Service in 100 per cent fashion.

I know that you men will coöperate as you have in the past when you are called upon to apply for commission. It seems to me, and I think it is true, that as someone has said, Procurement and Assignment Service is the flower of American Democracy, a voluntary agency supervising and solving its own problems.

The Speaker then asked for discussion from the floor.

Dr. A. H. Zachman, Melrose: I think it would be interesting if we could find out just how many medical men in the Armed Services are actually practicing medicine. I have personally taken it upon myself to write to several of my friends who are in the Service and supposedly practicing medicine. In every instance they told me they were doing book work. We talk about manpower and putting people in the right places and we find trained physicians and surgeons forced to keep records. We have our WAVES and WACs who are supposed to relieve men to fight; but no one apparently who can keep records for the Armed Forces. Just how many of these physicians are really essential, I wonder. Perhaps the number actually is not so high as they think. I grant you in case of actual combat many are needed. But in the camps in this country, where all the facilities and hospitals are available, I believe we have too many men sitting around doing nothing. At least I believe it is our duty as a medical association to find out.

Doctor Braasch: I think the doctor has raised a good question. I, too, know of a number of men who went out with base hospitals a year ago and have been sitting around doing practically nothing ever since. But we have to remember the Army and Navy are planning for a long war with 11,000,000 men and more in service. When these 11,000,000 actually go into active duty the doctors who appear to be sitting around now will be kept busy, particularly if they are in foreign service. It is necessary to have a pool to draw upon instantly. I believe, also, that both the Army and the Navy are cleaning house administratively and that many older men are being employed in office work so that younger men can be freed for active service. Mr. Rosell tells me that at least 1,000 laymen are being trained for administrative work each month. Also WACs and WAVES will be used for the purpose, both in the Army and the Navy. We do know that more and more are being used in active service now and many more will be used as soon as they can be transported. I doubt if there will be many sitting around at the end of the year.

The Speaker then called for a report from Dr. E. J. Simons of Swanville, Chief of the Medical Unit of the Division of Social Welfare.

Doctor Simons: Perhaps of major importance to the medical profession is the new appointee to the director-

ship of the Division of Social Welfare, especially in view of the fact that one man who occupied the position in earlier years was well known to be antagonistic to the profession and our interests suffered during his régime. Effective January 1, the Governor appointed Mr. Bernard LeVander to the position. Mr. LeVander is an attorney, a graduate of the University of Minnesota and a member of the Bar Association, with experience of some months in research work in Social Welfare. He comes to us well qualified and he has been extremely coöperative with the medical unit and the organized medical profession. Following the policy of his predecessor, Mr. Walter Finke, he has declared that nothing of a medical nature will be done in the Division of Social Welfare without consultation with authorized representatives of the profession. It is my opinion that our interests will be very well safeguarded by Mr. LeVander.

In the medical unit of the Division, there are three bureaus, the oldest of which is the Crippled Children's Bureau. The principal program of that Bureau continues to be the care of orthopedic defects of children under 21, referred to the clinics by their family physicians. There have been few significant developments in that program in spite of difficulties in personnel.

On February 15, 1942, a heart program was instituted under the Bureau, with approval of our Council. This program provides hospital and medical care for rheumatic fever patients referred to the clinic by their family physicians. During the first year of operation 47 such patients have been treated. The program operates only in six counties including rural Hennepin and Ramsey Counties, Dakota, McLeod, Scott and Carver Counties. Of the 47 treated, 36 were hospitalized and 132 visits were made to the clinic. It is hoped that next year siblings of these patients, if referred by their physicians, may also be cared for, with the approval of the Council.

An orthodontic program for cleft lip and cleft palate cases has also been under consideration, under auspices of the Bureau. The matter was discussed with the state-wide dental advisory committee and was referred to a subcommittee of orthodontists who submitted a fee schedule of $200 for each case. This schedule was higher than most others in the United States and, since the orthodontists have refused to make further concessions, the program has not progressed further at this time.

The third program carried on by the Crippled Children's Bureau is for cerebral palsy cases. Fifteen children from the Michael Dowling School have been cared for during the past year and it seems of significance that seven of those 15 have been returned to their home schools and a more nearly normal life.

The second Bureau under the medical unit is concerned with County Tuberculosis Sanatoriums. Only two developments have arisen in that Bureau. One is the equalization of rates between the state and county sanatoriums. As you know, the state sanatorium takes care of tuberculosis patients from 46 counties which have no institutions of their own. Patients from the other 41 are cared for in county institutions. Counties which send patients to the state sanatorium have been charged $1.40 a day for each patient while the cost to counties having their own institutions varies, according to actual cost of care. from $2.25 to $4.50 a day for their patients. This disparity has worked a hardship on some of the county sanatorium superintendents as well as the taxpayers of the forty-one counties and it has prevented treatment of many patients in nearby institutions. To aid the situation a law was passed in 1925 requiring the state to add five dollars a week for every patient from an unorganized county who is sent to one of the county institutions; but if rates are really to be equalized by this method a subsidy of $10.00 a week would have to be paid for these patients. We have felt that a better plan would be to raise the rate per day required from all counties for patients in the state sanatorium. Accordingly legislation was enacted permitting the Director of the Division of Social Welfare to raise that rate each year. It is hoped that this will be the first step toward making the best use of beds in all the sanatoria of the state. The whole matter was presented to the Council recently and the necessity for recodifying all of the laws dealing with tuberculosis in the State became manifest. The Council requested that such a recodification be considered and it is hoped that before the next session of the Legislature such a study can be made with the coöperation of Dr. Chesley and that the matter may be well enough advanced for some presentation to the Legislature.

The third Bureau is concerned with general medical care. This Bureau serves in an advisory capacity to county welfare agencies in all of the 87 counties of the State and these agencies handle aid to dependent children, aid to the blind, old age assistance, soldier and sailor relief, and direct relief. This Bureau works in close coöperation with the state-wide Medical Advisory Committee of Dr. A. W. Adson, Rochester; Dr. W. A. Coventry, Duluth; Dr. I. L. Oliver, Graceville; Dr. L. L. Sogge, Windom; Dr. R. H. Wilson, Winona, with Dr. Chesley and Mr. Rosell as ex-officio members. In December, a state-wide medical allowance schedule was promulgated by the Division and accepted and approved by 56 of the 84 rural counties. By way of contrast, it might be noted that the SERA schedule issued in 1933 and 1934 was accepted only by 61 counties after six years of effort, whereas the new schedule has been accepted by 56 in fifteen months. The dentists have changed their schedule to conform with the medical allowance schedule which provides for two-thirds of the current normal fee schedule.

At the last meeting of the state-wide Medical Advisory Committee, it was decided to make a special effort to see that more use is made of County Medical Advisory Committees. The load of indigency has markedly decreased, as you know. In February, 1940, there were 562,000 persons receiving public assistance in Minnesota. In June, 1942, the load was reduced to 243,000. With indigency at a low level it is probable that we can do more to establish practices and principles necessary in the postwar reconstruction period. Our interests and the interests of the patients will be much better served now and in the future by more active and energetic county committees.

There are three or four counties in the state in which medical bills are still quite controversial and in which the relationship between the medical profession and the County Medical Advisory Committee is not at all satisfactory. In such counties an active medical advisory committee could settle differences and cement friendship. In counties where there are not enough physicians to have a properly constituted advisory committee of three, some substitute should be provided. It has been suggested that the state-wide Medical Advisory Committee act in this capacity for such counties. It is hoped that physicians of such counties will use the State Committee whenever any controversial problem arises.

Three studies involving medical economics are being made by the Division. One concerns costs of medical care in all of the assistance programs in the six northern counties of the state. Procedures are being instituted in these counties so that at any time an investigator can tell how much money is being spent for medical care. Full coöperation of the physicians in these counties will be needed for these studies. The second is an agency review and investigation of county welfare boards. So far, ten counties have been studied. The third is a new study of organization and procedure. I believe I am justified in saying that at the present time the best interests of the medical profession are being amply protected by the Division of Social Welfare.

The Speaker then called for a report from Dr. A. J. Chesley, Secretary and Executive Officer of the State Board of Health.

Doctor Chesley: The health section of the Civilian Defense organization in Minnesota was organized about two years ago on the basis of your nine Councilor Districts. This was done at the suggestion of the Sanitary Conference, all members of which are physicians, many of them your officers. Each district has a health section and the chairman of that health section is the Councilor of the district. The general advisory committee is made up of representatives of each of the state associations having anything to do with health, the medical, dental, nursing, hospital and health officers' associations and the veterinarians. This is a rather unique method of organization among the states and was somewhat criticized at first. Now it is receiving favorable comment and some states are even changing over. We have endeavored, also, to get a member of each of your County Medical Advisory Committees on the County Defense organizations. The dentists, nurses and other organizations are all represented in the county groups, also. Each Association represented has provided a statement as to total membership, location of facilities, etc., so that we will know what we can count on in case of emergency. As time goes on, it is going to be more and more necessary with fewer people to know exactly what our resources are in case of sabotage or enemy action, here, or in case it is necessary to move people in here quickly due to an emergency elsewhere. I think, however, that we have a well-grounded program worked out and I am not afraid of what may happen in case of emergency in Minnesota.

Before I touch upon the work of the Board of Health I want to say that every member is proud of Dr. T. B. Magath, now a captain in the Navy Medical Corps, who is doing essential work for the Surgeon General in inspection of Naval Services throughout the world. For six months or more he has been literally in the air inspecting services in Central and South America and the Pacific and probably Africa. The work he is doing and his knowledge of tropical diseases is going to be of immense value to the country as a whole and to us here in Minnesota. We can expect diseases and conditions we are not accustomed to see here when the men return from service. Everyone in our Division of Preventable Diseases is now taking a special course on parasitology at the University. We are trying to prepare for what we believe will be the eventual return of men with many new types of infection, things which will complicate the clinical picture of the conditions you see daily and make them very difficult to understand unless you have differential laboratory diagnosis and clinical experience. Very few men in Minnesota have such experience. Some will come back from the Service who have it; but a large number are going to proceed to foreign countries and be held there for a while. We cannot expect many of them back early because the medical problems that will follow war and invasion are the most important type. There will be malnutrition and epidemics in a population of lowered resistance, the old people nearly dead and the young people in bad shape. There is no individual in that hopeless state of things who can do as much to rehabilitate and build up the faith of the people as the medical man. I know that from experience.

At present there are forty-seven men out of our Department in service. We have only a few doctors left and some of them will go before long. We are even worse off in relation to public health engineers and we know that there are in service now a large number of engineers, trained in specialties such as industrial health, chemistry, mathematics and artillery, who are engaged in other kinds of service for which they were not trained. For instance, the best man in the industrial laboratory in Connecticut where they have had industrial health work longer than anywhere else in the United States and where they have the reputation of having the best service in the country, is now a policeman in the Canal Zone. The engineers are now going through the files in Washington to find all the men who are trained in different specialties of engineering and who are in the services doing other kinds of work. They are going to ask for special detail for these men, leaving them connected with their military organizations, but directing them to proceed to special work.

Malaria is probably the greatest single health problem in the world at the present time. We have all the factors in Minnesota for a spread of the disease, though it may not prove to be serious here. But the new drugs they are using in place of quinine, though efficient, are not entirely successful because they do not work for everybody and living parasites can still be found in blood after the fever is brought down. To handle malaria we shall need more entomologists, more biologists and public health men.

The main difficulty in keeping up our well-organized system of public water supplies is lack of critical materials. It is nearly impossible to get certain materials that will be needed if a water system goes out of business. Water supplies are Mr. Whitaker's job in this state. Dr. L. W. Foker, Director of the Division of Industrial Health, is gas officer. He has taken special training in the subject and we are giving classes so that there will be trained people in every community of any size in the state to handle the situation in case of gas attack, a rather remote contingency, I think; but protection is essential and requires trained personnel.

The Division of Vital Statistics was obliged to do a job on an appropriation of $20,000 which would take at least $100,000 to handle it properly, last year. This last Legislature gave us only $50,000 to do the over 100,000 dollars worth of work. That is only one of the budget problems we have to face and our situation is not unique. It is common throughout the United States.

Fortunately we have had no serious epidemics anywhere and nothing in Minnesota. The rates on diphtheria, tuberculosis and typhoid fever and things we are dealing with every day are way down. We are studying other diseases such as influenza, for instance. We were fortunate in getting a grant from the Rockefeller Foundation for this work and it has been extended to cover encephalitis and Dr. McCord from the Central Laboratory of the Foundation is working on influenza. Somewhere along the line we hope that some measure of protection will be found when the next world-wide epidemic comes along.

Our most serious problem now, however, is personnel. A large number of women trained in bacteriology, serology and so forth want to be WAVES and WACs. They cannot be replaced because there simply aren't enough trained people anywhere in the United States to do that work. We have an immense amount of work to be done that is mandatory for the Armed Forces; but you can't blame people for taking the opportunity to see the world in a beautiful uniform when they are underpaid and overworked at home. That's the situation health officers are having to face throughout the United States.

We have greatly appreciated the coöperation of the Association, shown for instance, when you invited Dr. Haven Emerson of Columbia who is taking the place of Dr. Anderson at the University School of Public Health, to speak at the your County Officers' Meeting. Dr. Emerson urged promotion of full-time health units and last year the House of Delegates of the American Medical Association officially approved such organization. But the Surgeon General of the Public Health Service has announced that it will be impossible to assist in the extension of such public health units for the duration of the war. We will be losing men so fast from full-time health departments that there will be very little left and you part-time people will have to take up the load, in addition to your regular medical practice.

Tomorrow you are going to be asked to pass upon the plan for medical care of wives and infants of

men in enlisted grades in the services. It involves a fundamental question of policy and I am sure the Board will abide by your decision in the matter. The Board has been fortunate for many years in having a representative of your Association present at our meetings. It has been a very great assistance to us in deciding certain matters of policy and I can speak for the Board, I am sure, in thanking you for your coöperation.

The Speaker expressed the appreciation of the medical profession throughout the state for the coöperation of Dr. Chesley and the State Board of Health with the medical profession and asked for resolutions from the floor.

Dr. R. M. Burns of Saint Paul, Chairman of the Radio Committee, presented the following resolution, which was referred to the Committee on Resolutions:

WHEREAS the weekly broadcast on health conducted under auspices of the Minnesota State Medical Association passed its fifteenth anniversary on the air on April 4 of this year, and

WHEREAS: Dr. W. A. O'Brien of the University of Minnesota has acted as speaker on these broadcasts continuously since the program began and has established himself, in so doing, as one of the foremost radio educators of the country, and

WHEREAS the program which has been carried without cost to the Association over WCCO is one of the oldest and the most popular educational programs in the Northwest,

BE IT THEREFORE RESOLVED that this House express its deep appreciation and thanks to Dr. O'Brien for the unique contribution he has made through this work to medicine and the public health in Minnesota and also to Station WCCO for its public spirit in making time available without interruption for this program.

DOCTOR BURNAP: I would like to take a few minutes to present a resolution which is to be presented to the House of Delegates of the American Medical Association. About 18 years ago, Dr. Braasch and some of the leaders of that time organized the Northwest Regional Conference which met here annually and included states of this region. That Conference eventually became the National Conference on Medical Service which fills, I believe, an important place. But we found that we. here, had lost something and so in November we called a meeting of representatives from Minnesota, Wisconsin, North and South Dakota, Iowa and Nebraska (included at their own request). We found we could be mutually helpful in many respects and discovered, especially, that all of us had felt the need of better representation in Washington. Accordingly a resolution was drawn up and presented to the National Conference on Medical Service when it met in Chicago in February. At the National Conference, twenty-nine states were represented and they were unanimous in their feeling that some change should be made in our setup in the American Medical Association for protection of the public and the profession in Washington. The resolution passed in general terms at the Conference has been worked over and reworded by a Committee of the Conference. It has been approved by the Council which requests that it be presented to you for your endorsement with the understanding that if you approve, you will ask our delegates to introduce the resolution.

A RESOLUTION

To be presented to the House of Delegates of the American Medical Association at its next annual meeting in Chicago in June for establishing a Committee on Medical Service.

WHEREAS, the medical profession is conscious of its responsibilities in providing timely and adequate medical services to all of the American people, irrespective of race, creed or financial status, and

WHEREAS, it believes it to be its duty and right to make available scientific facts, data and medical opinion with respect thereto, and to make known the role that the science and art of medicine plays in the daily lives of all Americans, and

WHEREAS, the medical profession of the United States is ready to offer constructive leadership in the advancement of medical principles that will further medical service to all of the people, and to preserve, not only the science and art of medicine, but the standards associated with the practice of medicine in America;

NOW, THEREFORE, BE IT RESOLVED, that there is hereby created by this House of Delegates a Committee on Medical Service which shall be composed of the following members:

1. The president of the American Medical Association, ex officio.
2. The Immediate Past President of the American Medical Association.
3. The Secretary of the American Medical Association, ex officio.
4. A member of the Board of Trustees of the American Medical Association, designated and selected by the Board of Trustees.
5. One member of the American Medical Association elected as hereinafter provided from each of the following nine geographical subdivisions of the United States: New England, Middle Atlantic, East North Central, South Atlantic, East South Central, West South Central, West North Central, Mountain, and Pacific. [Names of states omitted for brevity's sake.]

The members of this House of Delegates from each of the foregoing geographical subdivisions of the United States shall elect one member of the American Medical Association to serve on said Committee; three of said nine members shall serve for one year; three shall serve for two years; and three shall serve for three years; the respective terms of office of the nine members first elected shall be decided by lot and thereafter the said terms shall be for three years each. The expiration date for the first one-year term shall be at the next ensuing annual session of the House of Delegates of the American Medical Association. Expiration dates for all terms shall coincide with the dates of the regular annual session, of the House of Delegates of the American Medical Association.

BE IT FURTHER RESOLVED, that the duties of the Committee on Medical Service shall be:

1. The making available of scientific facts and data and medical opinion with respect to timely and adequate rendition of medical care to the American people.
2. To integrate the activities of the Committee on Medical Service with respective state and county committees on like activities.
3. Establish relationships and coöperation with other allied groups who are likewise engaged in the rendition of medical care, in its various branches, to the American people.
4. The Committee on Medical Service shall hold at least two meetings per year; one shall be held at the time and place of the Annual Meeting of this House of Delegates; the other meeting shall be held in the City of Washington, D. C., and called at the direction of the Chairman; and such other meetings as may be necessary to be called by the Chairman upon the written request of the majority of the Committee.
5. The Committee shall forthwith and annually thereafter elect from its own membership a Chairman and a Vice Chairman.
6. The Committee on Medical Service shall establish and maintain an office in Washington, D. C., and shall further be empowered and directed to employ a full-time Executive Director, who shall act as Secretary of the Committee, and whose duties shall be specified by the Committee. Such Executive Director shall be a physician who has been actively engaged in the private practice of medicine for not less than five years during the previous ten years, and, furthermore, be informed and qualified to act as a Liaison Representative of said Committee.
7. The Committee on Medical Service is further authorized to hire such legal and administrative help as is necessary.

BE IT FURTHER RESOLVED, that the Committee on Medical Service shall submit a budget for its expenses for the fiscal year to the Board of Trustees of the American Medical Association, and it is the consensus of opinion of this House of Delegates that the Board of Trustees shall forthwith appropriate not less than fifty cents nor more than one dollar for each member of the American Medical Association so that adequate funds will be available for such Committee to carry out its work on an honorable and ethical plane in keeping with the standards of American Medicine.

BE IT FURTHER RESOLVED, that this Committee shall submit an Annual Report to the House of Delegates at their Annual Meeting.

AND BE IT FURTHER RESOLVED, that this resolution upon its adoption by the House of Delegates shall be forthwith transmitted to the Board of Trustees with the request that the Board of Trustee report back its action to the House of Delegates within twenty-four hours as provided for in the Constitution and By-Laws of the American Medical Association.

We have made every effort to ascertain the attitude of our Senators and Representatives and we find that they recognize the urgent need of representation in Washington. I would like to ask Dr. Adson if he will discuss this matter.

DR. A. W. ADSON, Rochester: We have been in contact with many men all over the United States on this matter but the prime movers have been the Chairman of our Council, Dr. Burnap, who is now President of the National Conference on Medical Service, and Dr. Palmer of Pittsburgh. We have looked into many angles of the situation and it seems to us that there is need for integration of our medical legislative program so as to make it effective, so that we can know what is

going on in Washington and so that the opinion of constituents can be brought to bear on national legislators. After the National Conference last February a committee called on Dr. Olin West and was told by Dr. West that the Central Office of the American Medical Association assumed the responsibility for conducting medical affairs in Washington and there was no need of any further machinery. The question to be considered is, of course, whether or not anything has occurred which has not been properly taken care of.

Perhaps I may be permitted to remind you of a few of the things that have been going on to show you the need.

First, you are all familiar with the court proceedings and decisions handed down in the Washington case. Justice Miller of the Court of Appeals of the District of Columbia made the statement in his decision that he was bound to comply with the law but intimated that the medical association had been negligent in not seeing that there were adequate amendments or provisions in the law protecting the profession.

Then there is the Tolan Bill introduced last year to permit chiropractors to treat injured federal employes. There has been no effort to counteract this proposal and the bill is up again. There is no medical or public health committee in the House or Senate and bills involving medical problems are handled by various committees such as the Labor and Finance Committees.

You are all familiar with directives issued in the last year or two by federal agencies and bureaus such as the one forbidding you to retain extra snow tires in addition to the regular five allowed. That matter was finally disposed of after much difficulty which could have been avoided.

I could go on at length on these matters, all of which show lack of advice on the spot which would have avoided endless difficulties afterwards. It is true that about a month after a bill is introduced, a copy reaches us through the central office; but that is too late. We have felt that something should be done and a new committee or agency of some sort created. We have felt, also, that if we tried to develop a new council the whole thing might be deferred perhaps for a year and inactivated by reason of the fact that the Trustees have the power to withhold funds.

It is not the purpose of this Committee to stir up a fight or to take from our national offices any of their authority; but we do believe the time has come when American medicine should speak. We took into consideration in drawing up the resolution the fact that if we wanted action we would have to word the resolution so that immediate action would be called for at the meeting in June. We felt also that to be effective the committee should be democratic, with representation from all of the geographical districts, and that appointments should be made at the June meeting. Also, we felt that the American Medical Association should have full knowledge and representation and so we included the president, the past president, a member of the Board of Trustees and the secretary of the American Medical Association. Furthermore, a specific plan for providing funds necessary to carry on the program has been included in the resolution. It is our belief that the new agency should be answerable to the House of Delegates, direct, at each annual meeting, for the reason that the Board of Trustees may, if it wishes, choke off all action by simply refusing funds from agencies that are answerable only to the Board. We are not doing this because we are belligerent or because we do not have confidence in the Board of Trustees. We fully appreciate the fact that we must have an agency such as the Board to carry on the business affairs of the organization. But we want action now, not one or two or three years from now. Furthermore, we want representation from the profession.

We realize of course that there will be certain objections and that the resolutions may be changed. Needless to say, many members of the Committee have taken this matter up with their own states and Dr. Burnap and Dr. Palmer have supplied information to other interested states so that at the present time there is a strong movement on foot throughout the country demanding that something be done at this meeting of the American Medical Association. I hope you will see fit to endorse this resolution and that you will instruct your delegates to present it from the floor in Chicago.

Doctor Burnap: One thing we neglected to mention is that the resolution has been sent out to every state medical association in the United States. We have had reports that a good many states have already adopted this resolution and have instructed their delegates to vote for it. Other states we are sure will do likewise as soon as their associations hold their meetings. We are not alone in this movement and we have many supporters who will assist us.

The Speaker announced that the resolution would be submitted to the Resolutions Committee and asked for any further resolutions.

Doctor Burnap presented a resolution of endorsement of *Hygeia,* the Health Magazine, which had been approved by the Council at the request of the Woman's Auxiliary. This resolution together with the other two were referred to Dr. R. W. Morse, Minneapolis, Chairman; Dr. F. H. Dubbe, New Ulm; and Dr. Logan Leven of Saint Paul, named by the Speaker to act as Committee on Resolutions.

At the request of the Speaker, Dr. Monte Piper, Chairman of the Historical Committee, then read the necrology report as follows, consisting of names of all members who died during the past year. The delegates stood for a moment of silence in honor of deceased colleagues.

NECROLOGIST'S REPORT

Frank Clinton Andrus, Minneapolis. Born 1907. University of Minnesota, 1933. Died November 14, 1942. Aged 35.

William Black, Mankato. Born 1879. University of Minnesota Medical School, 1909. Died February 12, 1943. Aged 64.

George F. Brooks, Stillwater. Born 1877. University of Minnesota, 1900. Died October 8, 1942. Aged 64.

Ernest L. Cheney, Duluth. Born 1877. Harvard, 1900. Died October 30, 1942. Aged 65.

Elmer Julius Eklund, Norwood. Born 1884. University of Minnesota, 1907. Died October 28, 1942. Aged 57.

George K. Hagaman, St. Paul. Born 1876. University of Minnesota, 1903. Died July 11, 1942. Aged 66.

Rorbye Hansen, Monticello. Born 1897. University of Minnesota, 1928. Died July 22, 1942. Aged 45.

Sherman S. Hesselgrave, Center City. Born 1872. University of Minnesota, 1894. Died August 12, 1942. Aged 70.

Addie R. Haverfield, Minneapolis. Born 1858. University of Minnesota, 1895. Died January 1, 1943. Aged 84.

A. D. Hirschfelder, Minneapolis. Born 1879. Johns Hopkins, 1903. Died October 11, 1942. Aged 63.

Edward Orson Hopkins, Rochester. Born 1910. Johns Hopkins, 1937. Died July 25, 1942. Aged 32.

Henry P. Johnson, Fairmont. Born 1855. Rush Medical College, 1879. Died March 31, 1943. Aged 88.

Edward L. Kannary, St. Paul. Born 1872. McGill University, Montreal, 1900. Died September 23, 1942. Aged 70.

Christ Wm. Kanne, Faribault. Born 1875. University of Michigan Medical School, 1900. Died March 18, 1943. Aged 68.

Wm. A. Lee, Fergus Falls. Born 1880. Northwestern University Medical School, 1911. Died November 22, 1942. Aged 63.

William B. Linton, Minneapolis. Born 1855. Jefferson Medical College, Philadelphia, 1886. Died September 13, 1942. Aged 87.

Hiram J. Lloyd, Mankato. Born 1876. Chicago College of Medicine and Surgery, 1911. Died January 14, 1943. Aged 69.

Gustav H. Luedtke, Fairmont. Born 1870. University of Minnesota Medical School, 1899. Died March 18, 1943. Aged 73.

C. F. McComb, Duluth. Born 1857. Rush Medical College, 1879. Died March 3, 1943. Aged 86.

Jens L. Ohnstad, McIntosh. Born 1868. Minneapolis College of Physicians and Surgeons, 1903. Died February 23, 1943. Aged 75.

Douglas T. Ormond, Waconia. Born 1903. St. Louis University, 1927. Died August 13, 1942. Aged 39.

Harry P. Ritchie, St. Paul. Born 1873. University of Minnesota, 1896. Died September 3, 1942. Aged 69.

Charles W. Simison, Hawley. Born 1878. University of Missouri, Columbia, 1907. Died March 7, 1943. Aged 66.

Michael C. Welch, St. Paul. Born 1874. University of Illinois College of Medicine, 1905. Died January 30, 1943. Aged 69.

Robert Lloyd Lee Windsor, Fergus Falls. Born 1902. Columbia University, 1932. Died December 30, 1942. Aged 40.

Leonard F. Woodworth, LeCenter. Born 1880. State University of Iowa, 1908. Died December 9, 1942. Aged 62.

William V. Lindsay, Winona. Born 1873. Missouri Medical College, St. Louis, 1898. Died April 24, 1943. Aged 69.

The meeting adjourned until 12 noon Monday, May 17, at the Hotel Dyckman.

HOUSE OF DELEGATES

Monday, May 17, 1943

Hotel Dyckman

Speaker Will called the meeting to order at 12:15 p.m. in the Hotel Dyckman. A quorum being present, he asked for the report of the Council from Dr. W. L. Burnap, Chairman.

DOCTOR BURNAP: The second meeting of the Council took place Monday morning at 7:30 a.m.

Drs. J. M. Hayes of Minneapolis and F. J. Savage of Saint Paul were recommended unanimously to succeed themselves as delegates to the American Medical Association with Drs. George Earl of Saint Paul and W. W. Will of Bertha, respectively, as alternates.

It was decided to send the roster of the members of the Association to Judges of the Probate Court, insurance companies and others. Letters acknowledging contributions made by the Association to the Minnesota Safety Council and the Minnesota Society for the Control of Cancer were read.

Changes in the recommendations of the Committee appointed to study the plan for medical, hospital and nursing care for expectant wives and sick infants of enlisted men in the military services were presented by Dr. R. L. J. Kennedy of Rochester, Chairman, and accepted. In accordance with the suggestion in the recommendation the following names are to be submitted to the State Board of Health from which a medical advisory committee may be appointed: Drs. W. L. Burnap, E. J. Simons, W. A. Coventry, R. L. J. Kennedy. The executive secretary was instructed to inform the Upper Mississippi Medical Society which submitted a resolution requesting the commissioning of women physicians in the Armed Forces, that a law has already passed Congress permitting commissions for women physicians.

Letters from the St. Paul Association of Commerce and the Mayor of St. Paul, inviting the Minnesota State Medical Association to hold its 1944 meeting in St. Paul, were read but no action was taken.

The President was asked to see Governor Thye concerning reappointment of Dr. A. W. Adson to the State Board of Medical Examiners.

It was decided that the Secretary and Executive Secretary should be empowered to act concerning the new lease for office space for the state headquarters.

It was moved, seconded and carried that the report be accepted.

The Speaker then called for the report of the Resolutions Committee, Dr. R. W. Morse of Minneapolis, Chairman.

DOCTOR MORSE: The resolution on *Hygeia* submitted last night contained a wording which we felt put too much responsibility on officers and members of the Association. We accordingly changed the last paragraph to read as follows:

"And recommends that the officers and members of the Association coöperate with the Auxiliary in increasing its distribution in all parts of the state."

With the change we recommend its adoption.

It was moved, seconded and carried that this and the following resolutions of thanks be adopted.

RESOLUTION ON HYGEIA

WHEREAS public education in health is an essential factor in the conquest of disease and, especially, in the successful conduct of the war and

WHEREAS *Hygeia*, the Health Magazine, published by the American Medical Association, maintains high professional standards of accuracy and is an effective aid to the physicians in the extension of information about health,

THEREFORE BE IT RESOLVED that the House of Delegates of the Minnesota State Medical Association, in recognition of the great need for authoritative health information hereby endorses *Hygeia*, the Health Magazine, and recommends that the officers and members of the Association coöperate with the Auxiliary in increasing its distribution in all parts of the state.

RESOLUTION

The thanks and appreciation of this House are extended:

—To the Hennepin County Medical Society for the excellent arrangements made as host society for this meeting and for the fine hospitality extended to us during the entire session and especially for the Open House on Monday night.

—To the management of the Hotel Radisson for the fine accommodations provided for the sessions and for the helpfulness of all members of the staff in providing for the comfort and convenience of guests.

—To the Radio Stations for their gracious contribution of radio time to broadcasts by our members and guests in the interest of essential public education about the importance of good health in these times.

—To the newspapers for their full and careful coverage of this meeting which has added so much to public knowledge of the aims and ideals of medical practice.

—To the Minneapolis Civic and Commerce Association for its courteous assistance in all arrangements for this meeting.

The resolution of appreciation to Dr. W. A. O'Brien and WCCO on the 15th anniversary of the former's broadcasts under auspices of the Association was read again by Doctor Morse and it was moved, seconded and carried that it be adopted.

DOCTOR MORSE: The last resolution (on establishment of a Committee on Medical Service and a headquarters in Washington) which is to be presented to the House of Delegates of the American Medical Association has been approved and recommended for adoption by this Committee. We were most unanimous in making this recommendation. In Hennepin County during the last year there was spontaneous expression of feeling regarding the present state of affairs which came to a head a few months ago in a resolution of similar nature which was unanimously passed by our executive committee and society. It has not been presented to this House because this new resolution came to our hands shortly after our own was passed. Ours was nebulous in its ideas and we are most pleased with the concrete suggestions in this resolution. We think the wording is ideal and that it sets up an organization which is workable. We hope it is so planned that it will not get side-tracked in parliamentary procedure. A great deal of gratitude should be expressed to the individuals who worked on it. We do not know them all but we do know that Dr. Burnap is one of the leaders. He and the others should have our gratitude. The Committee not only approves it but urges that instructions be given to the delegates to introduce the resolution in the House of Delegates of the American Medical Association and support its passage.

It was moved, seconded and carried that the report of the Committee on this resolution be accepted and the resolution adopted.

The Speaker asked the Secretary to give a second reading to the amendment to the Constitution, Chapter 5, Section 11, of the Constitution and By-Laws, read for the first time the day before. It was moved, seconded and carried that the amendment be adopted.

DOCTOR BURNAP: I want to say that I feel very much embarrassed at having been mentioned in connection with the passage of the resolution on the Committee on Medical Service. Of course I happen to be president of the National Conference and as such have done a good deal of writing about it but nothing could have been done about this matter without the aid of Mr. Rosell and Manley Brist and all the Council and Officers of the Association. I have been a sort of front for the other fellows to push the thing through. We certainly all of us appreciated the unanimous support we have had here. We would have been in an awful

fix if you had turned us down because we have already got state societies pretty well scattered over the Union adopting it. The farther we go and the more we study it, the more we realize how great the need is. Our proposal is not aimed at any officers at all but just at filling where the need is absolutely evident.

The Speaker then called for the recommendations by the Committee on Medical, Hospital and Nursing Care for Expectant Wives and Sick Infants of Enlisted Men in the Armed Services, of which Dr. R. L. J. Kennedy was chairman.

Doctor Kennedy: The first plan for medical services to expectant wives and sick infants of soldiers and sailors in the enlisted grades was approved at the Duluth meeting and subsequently by the Children's Bureau. It was in operation here until original funds were exhausted. When Congress eventually made more funds available for the program, it was impossible to continue under the same plan because requirements under the law and regulations of the Children's Bureau were altered for the new appropriation. It has therefore been necessary for the Committee to revise its original plan. The revised plan has been presented to the Council where it was approved this morning for final action by the House of Delegates. Significant points of variation include the following: Only wives and infants of enlisted men under certain grades are covered since many noncommissioned officers may have an income equal to or greater than that of commissioned officers in the lower grades. The new plan also specifically eliminates care of infants born out of wedlock and their mothers. Furthermore, a schedule of payments for services came with the new regulations to be accepted or modified as we see fit, subject to final approval of the Children's Bureau. A committee of doctors is to be named, too, and submitted to the State Board of Health as an advisory committee to aid in carrying out details of the program.

This Committee has modified the submitted schedule of payments so that it is in virtual agreement with the exception of the mileage allowance, with the standard allowances already adopted for relief care by 60 out of 84 counties of the state. It is left to the Council to name the physicians from which the Board is to select the Committee called for in the plan. If you approve the recommendations of this Committee they will be submitted to the Children's Bureau and final allocation of money to the state will depend upon the Children's Bureau's acceptance of our recommendations. It should be mentioned that coöperation of the hospital and nursing organizations is required also.

The Speaker then called on Dr. A. J. Chesley to discuss the proposal.

Doctor Chesley: Many inquiries have been coming in to the Governor's office as well as to us about this program. As a consequence Governor Thye called a conference in his office the other day to find out what was holding the program up in Minnesota. At that conference and at the subsequent meeting of the State Board of Health which he attended (the first so far as I know ever attended by a Governor of Minnesota) the status of the matter was explained to him fully. The Governor said: "Go ahead with your plans and if the Children's Bureau does not act immediately and favorably upon your application, let me know and I will see if there isn't some way to get something done so that you won't be under criticism for delaying something that the other fellow delayed."

It was moved, seconded and carried that the recommendations presented by Dr. Kennedy be accepted.

The Speaker then called for nominations for the office of President-elect.

Dr. C. B. Drake of Saint Paul placed in nomination the name of *Dr. E. M. Jones* of Saint Paul for *President-elect.* There being no other nominations it was moved, seconded and carried that the nominations be closed and that the Secretary be instructed to cast a unanimous ballot for Dr. E. M. Jones as president-elect.

Doctor Jones: Mr. Speaker and Members of the House of Delegates: I think it is needless for me to tell you how I feel about this very great honor which you have bestowed upon me today. I find a lack of words to express my appreciation. I have been a member of the Council for a few years and I want to say that I have considered it a great privilege to serve with this fine group of gentlemen. Before serving on the Council I felt that I had a fairly good knowledge of the workings of the offices and the various agencies of the Association. But after attending one meeting of the Council I found that I didn't know anything. These men put in a great deal of time and effort in trying to uphold the standards of medicine and to protect the interests of the individual doctor. Now I want to assure you that as President of the Association I will do everything I can to fulfill the duties of this office for the best interests of the Association. I thank you very much.

Dr. Richard Cranmer of Minneapolis was nominated for the office of *First Vice President.* There being no further nominations, it was moved, seconded and carried that the nominations be closed and that the Secretary be instructed to cast a unanimous ballot for Doctor Cranmer as first vice president.

Dr. Melvin Nelson of Granite Falls was nominated for the office of *Second Vice President* and there being no further nominations, it was moved, seconded and carried that the nominations be closed and that the Secretary be instructed to cast a unanimous ballot for Doctor Nelson for second vice president.

Dr. B. B. Souster of Saint Paul was nominated to succeed himself as *Secretary* and there being no further nominations, it was moved, seconded and carried that the nominations be closed and that the Speaker be instructed to cast a unanimous ballot for Doctor Souster as secretary.

Dr. W. H. Condit of Minneapolis was nominated to succeed himself as *Treasurer* and there being no further nominations, it was moved, seconded and carried that the nominations be closed and that the secretary be instructed to cast a unanimous ballot for Doctor Condit as treasurer.

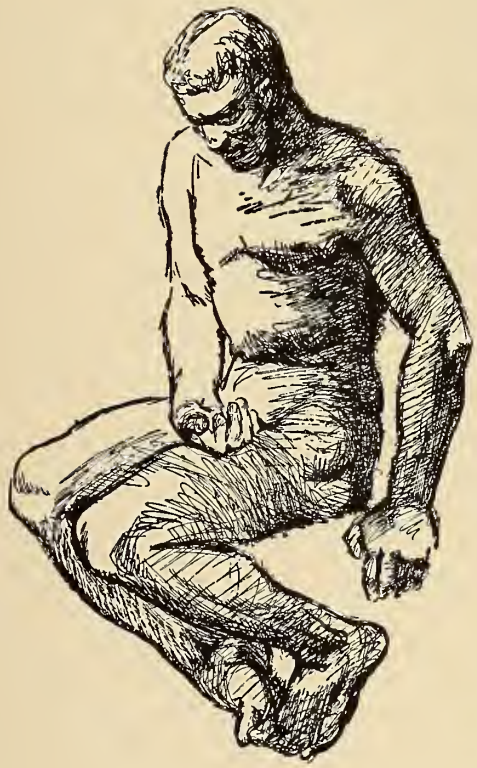
Vice Speaker E. A. Meyerding of Saint Paul having assumed the chair, *Dr. W. W. Will* of Bertha was nominated to succeed himself as *Speaker of the House of Delegates.* There being no further nominations, it was moved, seconded and carried that the nominations be closed and that the secretary be instructed to cast a unanimous ballot for Dr. Will as speaker.

Dr. E. A. Meyerding of Saint Paul was then nominated for the office of *Vice Speaker of the House of Delegates,* Doctor Will having resumed the chair, and there being no further nominations, it was moved, seconded and carried that the nominations be closed and that the Secretary be instructed to cast a unanimous ballot for Doctor Meyerding for vice speaker of the House of Delegates.

Dr. C. M. Johnson of Dawson was nominated to succeed himself as *Councilor of the Third District* and there being no further nominations, it was moved, seconded and carried that the nominations be closed and that the Secretary be instructed to cast a unanimous bal-

(Continued on Page 928)

In the "Chronic Fatigue" of Mild Depression



After employing Benzedrine Sulfate therapy in a series of 40 patients diagnosed as suffering from nervous exhaustion, Nathanson concludes:

"In approximately 80 percent of the patients there was a marked amelioration of this symptom (fatigue). Many of the patients had complained of fatigue for long periods and had tried various types of treatment without benefit . . .

"A sense of increased energy and capacity for work was noted in more than half of the cases. In addition a feeling of exhilaration and sense of well being was a consistent effect . . . Many patients volunteered that there had been a definite increase in mental activity and efficiency." Nathanson, M. H.—J. A. M. A., 108:528, 1937.

Benzedrine Sulfate Tablets

Brand of racemic amphetamine sulfate

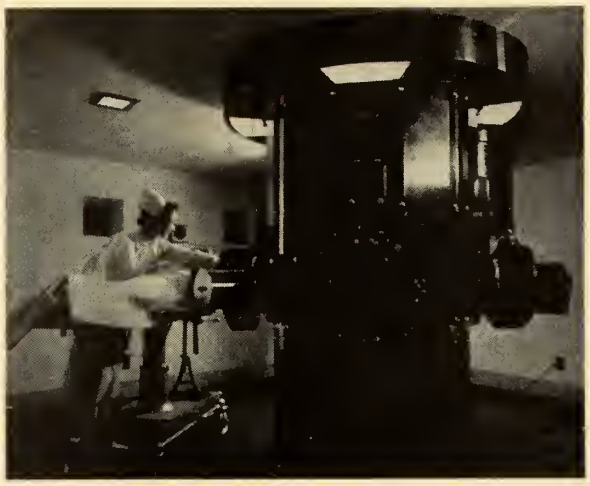
Benzedrine Sulfate is primarily useful in depressions characterized by apathy and psychomotor retardation, but is contraindicated in patients manifesting anxiety, hyperexcitability, or restlessness.

The use of Benzedrine Sulfate by normals should not be permitted; it should always be administered under the careful supervision of a physician; and depressive psychopathic cases should be institutionalized.

In treating depressed patients with Benzedrine Sulfate, the physician should bear in mind that any drug which produces pleasant or euphoric effects may prove to be habit forming—especially in unstable or neurotic individuals.

SMITH, KLINE & FRENCH LABORATORIES
PHILADELPHIA, PA.

Radiation Therapy Institute



Treatment Room

of Saint Paul

CHARLES T. MILLER HOSPITAL

Facilities for Radium and Roentgen Therapy, Including Million Volt Constant Potential Installation of Most Advanced Design.

You are cordially invited to visit the Radiation Therapy Institute and inspect its facilities

Edward Schons, M.D., *Director* J. P. Medelman, M.D., *Associate Director*

(Continued from Page 926)

lot for Doctor Johnson as Councilor of the Third District.

Dr. E. M. Hammes of Saint Paul was nominated for the office of *Councilor of the Fifth District* to succeed Doctor Jones. There being no further nominations, it was moved, seconded and carried that the nominations be closed and that the Secretary be instructed to cast a unanimous ballot for Doctor Hammes as Councilor of the Fifth District.

Dr. E. J. Simons of Swanville was nominated to succeed himself as *Councilor of the Seventh District.* There being no further nominations, it was moved, seconded and carried that the nominations be closed and that the Secretary be instructed to cast a unanimous ballot for Doctor Simons for Councilor of the Seventh District.

Following the recommendation of the Council, the names of the following delegates and alternates to the American Medical Association were placed in nomination to succeed themselves: *Dr. F. J. Savage,* Saint Paul, and *Dr. J. M. Hayes* of Minneapolis as *Delegates* and *Dr. George Earl* of Saint Paul and *Dr. W. W. Wi* of Bertha, respectively, as alternates.

There being no further nominations from the floo it was moved, seconded and carried that the nomi nations be closed and that the Secretary cast a unani mous ballot for the above listed nominees (Docto Meyerding having assumed the chair during deliber ations on the election of Doctor Will as alternate t Doctor Hayes).

An invitation was extended by Dr. M. J. Anderso of Rochester to hold the 1944 meeting at Rochester. I was moved, seconded and carried that the invitatio be accepted and that the next meeting be held in Roches ter at a date to be set later by the Council. There be ing no further business to come before the House, th meeting adjourned.

Lactic acid which makes sour milk sour is a value material in several industrial, medical and food uses it is used in tanning, in carbonated beverages and feed ing formulas for babies, and as calcium lactate to sup ply lime to the body.

ZEMMER

PRESCRIBE or DISPENSE ZEMMER PHARMACEUTICALS

Tablets, Lozenges, Ampoules, Capsules, Ointments, etc. Guaranteed reliable potency.

Our products are laboratory controlled. Write for catalogue.

Chemists to the Medical Profession

MIN 10-43

Zone 13

THE ZEMMER COMPANY ★ OAKLAND STATION ★ PITTSBURGH, PENNSYLVANIA

EPORTS and ANNOUNCEMENTS

MERICAN BOARD OF OBSTETRICS ND GYNECOLOGY

The next examination to be conducted by the Board ll be on February 12, 1944, in various cities in the ited States and Canada, and will consist of a written amination and the submission of twenty-five case his- ries (Part I). Part II, which will be oral-clinical and thological, will be held in May, 1944.

Candidates must be citizens of the United States or nada, must have been out of medical school not less an eight years, must have served an approved one-year ernship and had at least three years of special formal ining or its equivalent. Applications must be in the ce of the secretary, Dr. Paul Titus, 1015 Highland ilding, Pittsburgh 6, Pennsylvania, by November 15, 43.

SSOCIATION OF MILITARY SURGEONS F THE UNITED STATES

Representatives from some fourteen foreign countries ll attend the fifty-first annual convention of the As- ciation in Philadelphia, October 21 to 23, 1943.

Among those who will take part in the program are eutenant General Sir Alexander Hood, Director Gen- al of the British Army Medical Services, Major Gen- al C. Max Page and Colonel Frank S. Gillespie of e Royal Army Medical Corps, Brigadier General B. Chisholm, Director General of the Medical Serv- s of the Royal Canadian Army, Surgeon Captain A. cCallum, Wing Commander H. A. Peacock, Wing mmander L. M. Emard, and Lieutenant Colonel T. A. bbetter of the Royal Canadian Army. Australia, the etherlands, Peru, Yugoslavia and Iran, Greece, Nor- ay, Nova Scotia, Uruguay, and Haiti will also be presented.

It is expected that besides some two thousand doctors w attached to the armed forces here and abroad, ousands of civilian doctors will also attend.

Offices of the Association are at Room 603, 1520 Lo- st Street, Philadelphia, Pennsylvania.

NNUAL MEETING PLANS, MSMS

In anticipation of the annual state convention of the innesota State Medical Association to be held in ochester next spring, Dr. H. L. Smith, president of e Olmsted-Houston-Fillmore-Dodge County Medical ciety called a meeting of the executive board in Sep- mber to name committees for the conclave.

General chairman for the meeting is Dr. J. A. Bargen. On the general advisory committee, of which Dr. . Z. Giffin is chairman, are Dr. L. A. Buie, Dr. M. S. enderson, Dr. B. E. Hempstead and Dr. A. W. Adson. General arrangements will be made by Dr. E. H. ynearson, chairman, Dr. M. W. Binger, Dr. W. E. errell, Dr. N. W. Barker and Dr. C. W. Rucker of ochester, and Dr. H. R. Baker of Hayfield.

PRENATAL VARICOSITIES
And Foot Discomfort
May Be Lessened by a
SPENCER SUPPORT



Scientific Abdominal Support Plus Posture-Improvement May Also Lessen Chance Of Development Of . . .

TOXEMIA
EDEMA
PTOSIS
NAUSEA
Non-pathological
HEMORRHOIDS
SACROILIAC
And Other Back Sprains
HARMFUL POSTURE

At left: Light, flexible Spencer Maternity Support. Side-lacers easily widened as figure enlarges. Supports lower abdomen—elastic inserts permit freedom at upper abdomen. Improves posture.

Since each Spencer Support is individually designed, cut and made to meet the specific needs of the one patient who is to wear it, it is remarkably more effective than a ready-made support—and far more comfortable and durable. Individual designing also makes possible our *guarantee* that a Spencer will never lose its shape, thus providing continuous support and posture-improvement.

The Spencer Corsetiere not only delivers the completed garment and adjusts it properly on patient, but keeps in touch with the patient, thus saving the doctor time and bother.

Spencers are never sold in stores. For a Spencer Specialist, look in telephone book under "Spencer Corsetiere" or write direct to us.

SPENCER *INDIVIDUALLY DESIGNED*
Abdominal, Back and Breast Supports

SPENCER INCORPORATED,
137 Derby Ave., New Haven 7, Conn.
In Canada: Rock Island, Quebec.
In England: Spencer (Banbury) Ltd., Banbury, Oxon.

May We Send You Booklet?

Please send me booklet, "How Spencer Supports Aid the Doctor's Treatment."

.....M. D.

Address O10

PROFESSIONAL PROTECTION

SINCE 1899 SPECIALIZED SERVICE

In addition to our Professional Liability Policy for private practice we issue a special
MILITARY POLICY
to the profession in the Armed Forces at a
REDUCED PREMIUM

THE
MEDICAL PROTECTIVE COMPANY
OF
FORT WAYNE, INDIANA

Cook County Graduate School of Medicine

(In Affiliation with Cook County Hospital)

Incorporated not for profit

ANNOUNCES CONTINUOUS COURSES

SURGERY—Two Weeks' Intensive Course in Surgical Technique starting November 1st, 15th, and 29th, and every two weeks throughout the year.

MEDICINE—Courses to be announced in January.

FRACTURES & TRAUMATIC SURGERY—Courses to be announced in January.

GYNECOLOGY—Two Weeks' Intensive course starting February 7th. One-Week Personal Course in Vaginal Approach to Pelvic Surgery starting November 1st. Clinical and Diagnostic Courses.

OBSTETRICS—Two Weeks' Intensive Course starting February 21st.

ANESTHESIA—One-Week Course in Continuous Caudal Anesthesia for Obstetrics.

OPHTHALMOLOGY—Clinical Course.

OTOLARYNGOLOGY—Special and Clinical Courses.

ROENTGENOLOGY—Courses in X-Ray Interpretation, Fluoroscopy, Deep X-Ray Therapy every week.

UROLOGY—Two Weeks' Course and One-Month Course available every two weeks.

CYSTOSCOPY—Ten-Day Practical Course every two weeks.

General, Intensive and Special Courses in All Branches of Medicine, Surgery and the Specialties.

TEACHING FACULTY — ATTENDING STAFF OF COOK COUNTY HOSPITAL

Address:
Registrar, 427 S. Honore St., Chicago 12, Ill.

Clinics and scientific exhibits will be arranged for by Dr. B. T. Horton, chairman, Dr. A. H. Bulbulian, Dr O. T. Clagett and Dr. A. B. Hunt, all of Rochester, and Dr. C. B. McKaig of Pine Island.

Plans for entertainment and banquet will be made by Dr. J. S. Lundy, chairman, Dr. J. M. Stickney, Dr L. A. Brunsting, Dr. H. H. Young and Dr. J. L. Emmett. The golf program will be under the direction of Dr. J. W. Kernohan, chairman, Dr. W. D. Shelden and Dr. C. A. Good.

Dr. R. L. J. Kennedy is chairman of the publicity committee which consists also of Dr. A. B. Nevling and Dr. L. M. Eaton of Rochester and Dr. C. E. Bigelow of Dodge Center.

Members of the registration and hotel reservation committee are Drs. A. M. Olsen, chairman, E. H. Schlitgu and G. Slade Schuster.

Other officers of the county medical society are Dr N. T. Norris of Caledonia, vice president, and Dr M. J. Anderson, secretary-treasurer.

WASHINGTON COUNTY

The regular monthly meeting of the Washington County Medical Society was held in Stillwater on Tuesday, September 14.

E. Mendelssohn Jones, M.D., president-elect of the Minnesota State Medical Association, was the guest speaker. His subject, "Appendicitis," was most thoroughly covered in all ages and types, with complications from acute to moribund, from experiences gathered in a very large number of cases. The doctor also spoke on Socialized Medicine, in connection with Senate File No. 1161, as sponsored by the government, and also Child Welfare, from information gleaned at the Milwaukee meeting recently.

All members of the Society in service now are abroad except William W. Moir, who is at Fort Benning Georgia; he has been promoted to Major. Dr. George McC. Ruggles is reported at some station in the Pacific; he has also been promoted. Dr. Emmett R. Samson is in the Pacific. Dr. Russell E. Carlson has recently been sent to some station in Europe or Africa.

Dr. Stella L. Wilkinson is now located at Moose Lake State Hospital as a member of the medical staff.

Members have been active in their fight against the bill S. F. No. 1161 and a number attended the August 10 meeting at the Radisson Hotel.

E. Sydney Boleyn, M.D., Secretary

E. STARR JUDD LECTURE

The eleventh E. Starr Judd lecture will be given by Major General Norman T. Kirk, Surgeon General, United States Army, War Department, at the University of Minnesota, Monday evening, December 6, 8:15 in the Museum of Natural History Auditorium. Subject is "Surgery in War."

Agar-agar, formerly obtained from Japanese and Chinese seaweed and used in the artificial cultivation of bacteria, is now a scarce material; the U. S. Bureau of Fisheries is searching for American agar-producing seaweeds.

In Memoriam

PHILIP A. DELAVAN

Dr. Philip A. Delavan, prominent Otolaryngologist of Saint Paul, Minnesota, died September 12, 1943, at St. Joseph's Hospital, Saint Paul, at the age of forty-four, following an illness of eleven days.

Born in Minneapolis, August 24, 1899, he was a resident of Saint Paul for forty-two years. He attended St. Thomas Academy and College and received his medical degree from the University of Minnesota in 1927. He interned at Ancker Hospital in Saint Paul, in 1926-27. After engaging in general practice he became resident physician for Eye, Ear, Nose and Throat ailments at the Ancker Hospital during 1931-32. He took a postgraduate course in eye, ear, nose and throat at Johns Hopkins Medical School in 1932-33, after which he returned to Saint Paul and practiced his specialty at his office in the Lowry Medical Arts Building, until the time of his death.

He was a member of the Alpha Kappa Kappa fraternity, Saint Paul Medical Club, Ramsey County Medical Society, Minnesota State Medical Society, American Medical Association, American College of Otolaryngology, and was on the staff at St. Joseph's, Midway, Ancker, and Children's Hospitals and was an instructor in Otolaryngology at the University of Minnesota.

Dr. Delavan was a veteran of World War I and shortly before his illness had completed arrangements to enter service in the present war.

In 1931 he was married to Stella McKeon, daughter of the late Dr. Owen McKeon of this city. He is survived by his wife and four children, Stella Beth, Philip Owen, Mary and William.

A gentleman and a conscientious physician, he was extremely well liked by his associates, and is a severe loss to his family, his friends and to this community.

—H. J. Prendergast, M.D.

PATIENTS ARE TURNED AWAY BECAUSE OF NURSE SHORTAGE

Shortage of nurses is compelling some hospitals to turn away patients and service standards are going down despite efforts to recruit "women in white." While more and more skilled nurses are being drawn into military service and industry, the number of patients in hospitals is increasing, judging from information based on reports to the U. S. Public Health Service released by the Office of War Information.

Increased war production has jumped industrial accidents to an estimated 2,500,000—more than a third over the 1939 level. Secretary of Labor Frances Perkins states that more than 2,000 workers suffer disabling injuries in manufacturing plants every day. And disease is given new holds by crowded living conditions and relaxed sanitary standards.

To meet growing war needs for nurses America will need 359,000 nurses next year—100,000 more than are now available. Of this number 66,000 would go to the military services, 293,000 to civilian practice.—*Science News Letter,* August 28, 1943.



Of General Interest

Dr. A. F. Geis has joined the staff of the Oliver Clinic at Graceville. Dr. Geis was formerly a member of the staff of Fairview Hospital, Minneapolis.

* * *

Dr. S. D. Wolstan, who has practiced in Minneota since April, 1939, has received his commission as First Lieutenant in the U. S. Army Medical Corps.

* * *

Dr. Clarence Siegel, formerly of Battle Lake, where he was associated with the Otter Tail County Sanitarium as superintendent, has moved to Minneapolis and will be a member of the staff of Glen Lake Sanitarium.

* * *

Dr. M. T. Gorsuch of Rochester has been granted a leave of absence from the Mayo Clinic beginning September 7 to serve as a First Lieutenant in the Medical Corps of the U. S. Army.

* * *

Dr. H. T. Gustason of Minneapolis reported for duty September 27 to the destroyer base at San Diego, California, as a navy surgeon. He has been commissioned Lieutenant Commander in the Medical Corps.

* * *

Dr. Leo S. Burns, practicing physician in South Saint Paul for the past several years, has reported for duty in the United States Army at Carlisle Barracks, Pennsylvania. Dr. Burns has received the commission of Captain.

* * *

Dr. David T. Schuele of Chatfield recently assumed the management of the Chatfield Hospital, following the retirement of Mrs. T. J. Koehler, who has acted as manager the past three years.

* * *

Dr. R. V. Jolin of Grand Rapids has been commissioned Lieutenant Commander in the U. S. Naval Reserve and has reported for duty at Oakland, California, at the United States Naval Hospital there.

* * *

Dr. Charles H. Mead, who has practiced surgery in Duluth since 1933, has been commissioned Lieutenant Commander MC V (S) USNR and will report for active duty at the United States Naval Hospital, Long Beach, California, October 11.

* * *

Dr. A. W. Ide, Chief Surgeon of the Northern Pacific Beneficial Association Hospital in Saint Paul and of the Railroad east of Mandan, North Dakota, retired October 1, after thirty-eight years of service. Dr. B. J. Derauf, assistant surgeon at the Saint Paul hospital since 1938, succeeded him.



VOCATIONAL HOSPITAL

Director of Nurses—M. H. WOLTMAN, R.N., B.S.
Superintendent & Dietitian—H. B. BROWN, B.S.

. . . An integral part of the Miller Vocational High School offers two special features—Patients receive a maximum of personal attention from student practical nurses—All food is prepared under the direction of a qualified dietitian. Patients remain under the care of their own physicians.

Physicians may secure services of Vocational nurses by calling Nurses Headquarters and asking for a Vocational Nurse

Bridgeport 2281

5511 South Lyndale - - Minneapolis

DANIELSON MEDICAL ARTS PHARMACY, INC.

PHONES:
ATLANTIC 3317
ATLANTIC 3318

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

HOURS:
WEEK DAYS—8 to 7
SUN. AND HOL.—10 TO 1

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.

414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.

INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS

MAIN 2494

Dr. H. H. Leibold of Parkers Prairie was elected president of the Northern Minnesota Medical Association at the annual meeting held in Duluth, on August 29. Dr. Richard Bardon, Duluth, was named vice president and Dr. R. N. Jones of St Cloud was reelected secretary-treasurer. The time and place of the 1944 meeting will be determined at a meeting of the new board early next year.

* * *

Dr. William A. O'Brien of Minneapolis was awarded an honorary fellowship in the American College of Hospital Administrators at their meeting in Buffalo, New York, September 12. He was cited for his "profound interest in problems of the hospital administrator, manifested by outstanding service as director of seven institutes for hospital administrators at the Center for Continuation Study, Minneapolis."

* * *

Dr. M. O. Oppegard, chairman of the Sunnyrest Sanatorium board, announced that Dr. Rudolph Johnson of Worthington had been appointed medical director and superintendent of Sunnyrest Sanatorium at Crookston. He is succeeding the late Dr. W. G. Paradis for the past five years. Dr. Johnson was assistant medical director and superintendent of the Southwestern Sanatorium at Worthington.





REST HOSPITAL

A quiet, ethical hospital with therapeutic facilities for the diagnosis, care and treatment of Nervous and Medical cases. Invites coöperation of all reputable physicians who may supervise the treatment of their patients.

PSYCHIATRISTS IN CHARGE
Dr. Hewitt B. Hannah
Dr. Joel C. Hultkrans

2527 2nd Ave. S., Minneapolis, Phone At. 7369



The Birches Sanitarium, Inc.

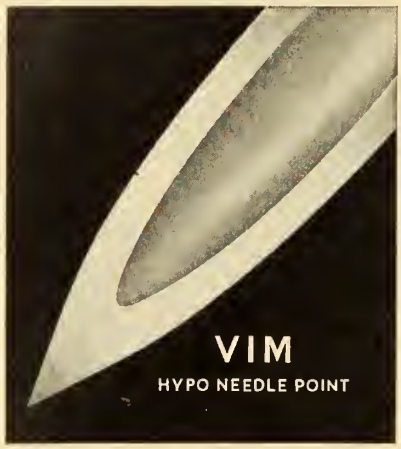
2391 Woodland Avenue

Duluth, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Psychiatrists in Charge

L. R. Gowan, M.D. A. S. Nissen, M.D.



VIM

SYRINGES AND NEEDLES

of

LASTING QUALITY

Distributed by

BROWN & DAY, INC.

ST. PAUL, MINN.

Accident, Hospital, Sickness

INSURANCE

PC OMAHA PH OMAHA

For ethical practitioners exclusively
(57,000 Policies in Force)

$5,000.00 accidental death $25.00 weekly indemnity, accident and sickness	For **$32.00** per year
$10,000.00 accidental death $50.00 weekly, indemnity, accident and sickness	For **$64.00** per year
$15,000.00 accidental death $75.00 weekly indemnity, accident and sickness	For **$96.00** per year

ALSO HOSPITAL EXPENSE FOR MEMBERS, WIVES AND CHILDREN

41 Years Under the Same Management

$2,418,000.00 INVESTED ASSETS

$11,750,000.00 PAID FOR CLAIMS

$200,000 deposited with State of Nebraska for protection of our members.

Disability need not be incurred in line of duty—benefits from the beginning day of disability.

86c out of each $1.00 gross income used for members' benefit

PHYSICIANS CASUALTY ASSOCIATION
PHYSICIANS HEALTH ASSOCIATION

400 First National Bank Building OMAHA 2, NEBR.

The law enacted by the last State Legislature concerning compensation of employes for occupational diseases provides that in case a claim involving controversial medical questions is allowed by the Commission after the taking of testimony, a medical board of three physicians from a panel of fifteen, chosen from throughout the state by the Dean of the Medical School, the Council of the Minnesota State Medical Association, and the Governor, shall be chosen to act in the case. The law provides that the panel of fifteen physicians shall be made up of ten with experience in the diagnosis and treatment of industrial disease and five x-ray specialists. Members of the panel were listed in the September number of MINNESOTA MEDICINE.

* * *

Attention of all physicians is called to the following regulation of the Harrison Narcotic Act by request of the Federal Narcotic Bureau:

"All prescriptions for drugs and preparations shall be dated as of and signed on the day when issued and shall bear the full name and address of the patient and the name, address and registry number of the practitioner . . . Prescriptions should be written with ink or indelible pencil or typewritten; if typewritten, they shall be signed by the practitioner. The duty of properly preparing prescriptions is upon the practitioner and he is liable to the penalties provided by the act in case of failure to insert the information required by law . . ."

Classified Advertising

FOR SALE: Active practice at Bird Island, Minnesota. W. J. Bushard, M.D.

WANTED: Location or group association by doctor now completing internship. Address D-60, c/o MINNESOTA MEDICINE.

ASSISTANT WANTED—General practitioner. $600.00 a month for first period, then option of percentage or cash salary, if satisfactory. Address D-61, care MINNESOTA MEDICINE.

The DAILY LOG



Ideal Help for "Pay-as-You-Go" Tax Reporting

Just examine this one-volume office bookkeeping system. See for yourself how its simplicity, brevity and completeness keep the financial side of your practice right "on top". Now's the time to investigate. Write for your copy of the "Log" today. It's guaranteed to satisfy. Or, ask for literature. Price $6.00 postpaid.

COLWELL PUBLISHING CO., 226 University, Champaign, Ill.

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.

414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.

INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS

MAIN 2494

SAVE TIME!
TRY DAHL'S FIRST

Biologicals
Pharmaceuticals
Hypodermic Medications
Dressings
Surgical Instruments
Trusses

7:30 a.m. to 11 p.m.
Holidays, 9 a.m. to 11 p.m.

Joseph E. Dahl Co.

Incorporated

ATlantic 5445 — 82 So. 9th St., Mpls.

Radiological and Clinical

Assistance to Physicians
in this territory

MURPHY LABORATORIES

Minneapolis: 612 Wesley Temple Bldg. - - At. 4786
St. Paul: 348 Hamm Bldg. - - - - - - - Ce. 7125
If no answer, call - - - - - - - - - - Ne. 1291



Orthopedic Braces and Appliances

Physicians' specifications followed precisely.
Scientific manufacture and fitting.

AUGUST F. KROLL

Manufacturer
230 WEST KELLOGG BLVD.
St. Paul, Minn. CE. 5330

Hall & Anderson

PRESCRIPTION PHARMACY
BIOLOGICALS
PHYSICIANS' SUPPLIES

SAINT PAUL, MINN.

LOWRY MEDICAL ARTS BUILDING
TELEPHONE: CEDAR 2735

★ V ★ V ★ ★ V ★ V ☆

V For a Quick Victory

Do more than your share in this month's

VICTORY BOND DRIVE

Ask us for information regarding our various

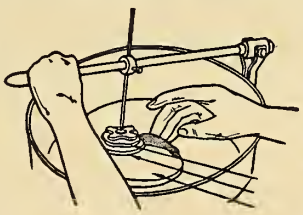
AMERICAN WAY SERVICES

THE AMERICAN NATIONAL BANK

BREMER ARCADE 7TH AT ROBERT — *Free Parking* — *Member Federal Deposit Insurance Corporation*
Cedar 0573

★ V ★ V ★ ★ V ★ V ★

UNUSUAL LENS GRINDING



CATARACT, MYO-THIN and other difficult and complicated lenses are ground to extreme thinness and accuracy by our expert workmen.

ARTHUR F. WILLIAMS

SAINT PAUL
MINNESOTA

Save 25 to 40 Per Cent

Druggists' Mutual Insurance Company

OF IOWA, ALGONA, IOWA

Fire - Tornado - Automobile Insurance

Prompt Loss Service

Minneapolis Branch—S. E. STRUBLE, 835 Palace Bldg.

Home Office—Algona, Iowa



Glenwood Hills Hospitals

3501 Golden Valley Road
Hyland Station
Route Seven

One of the Views

Operated in Connection
with
Homewood Hospital

Plymouth at Penn Avenue, Minneapolis

FOR THE TREATMENT OF NON-SURGICAL AND NON-INFECTIOUS DISEASES—A modern hospital built on the cottage plan. The buildings are located on elevated land, affording beautiful views on all sides. Glenwood Hills Hospitals have all the advantages of rural surroundings, and are still only a few minutes by automobile from the Minneapolis loop.

AN INVITATION—The facilities of these institutions are available for all reputable members of the medical profession.



HOMEWOOD HOSPITAL is one of the Northwest's outstanding hospitals for the treatment of Nervous Disorders—equipped with all the essentials for rendering high grade service to patient and physician.

Operated in Connection with
Glenwood Hills Hospitals

HOMEWOOD HOSPITAL

Corner Penn and Plymouth Avenues North
Minneapolis Minnesota

Social and Educational Adjustment

for exceptional children of all ages. Visit the school noted for its work in educational development and fitting such children for more normal living. Beautiful grounds. Home atmosphere. Separate buildings for boys and girls.

Catalog by request.

The MARY E. POGUE SCHOOL

124 GENEVA ROAD WHEATON, ILL.
(NEAR CHICAGO)

Send us your slow collection items.

All accounts made by personal calls.

We specialize in Medical and Dental Accounts.

Bonded and Licensed Under Minnesota State Laws

Northwestern Adjustment Co.

518 Bremer Arcade Bldg.
St. Paul Minnesota

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 **November, 1943** **No. 11**

Contents

White Bile.
Arnold Schwyzer, M.D., Saint Paul, Minnesota.. 955

Abnormal Uterine Bleeding in Adolescence.
Nora Winther, M.D., Minneapolis, Minnesota.... 961

Hemorrhage in Pregnancy.
F. J. Schatz, M.D., Saint Cloud, Minnesota..... 968

Hemorrhage in the Menopause.
Lawrence M. Randall, M.D., Rochester, Minnesota 976

Experiences with the Rh Substance in Transfusion Reactions.
R. W. Koucky, M.D., Minneapolis, Minnesota.... 980

Clinical-Pathological Conference.
Presentation of a Case.
A. J. Hertzog, M.D., and *S. V. Lofsness, M.D.,* Minneapolis, Minnesota 991

History of Medicine in Minnesota.
History of Medicine in Dodge County (Continued)
James Eckman, Rochester, Minnesota and *Charles E. Bigelow, M.D.,* Dodge Center, Minnesota 992

President's Letter 997

Editorial:
Will Congress Swell the Ranks of Bureaucracy?. 998
Sulfamerazine 998
Barbiturate Prescriptions 999
Orders for Industrial Nurses..... 999

Medical Economics:
Big Business Points the Way.....1000
Threat to Freedom 1001
Minnesota State Board of Medical Examiners....1002

Industrial Health:
Standing Orders for Nurses in Industry.....1004

Minnesota Academy of Medicine:
Meeting of May 12, 1943.....1008
Enterogenous Cysts of the Rectum.
Harold E. Hullsiek, M.D., Saint Paul, Minnesota 1008
Acute Obstruction of the Bowel.
A. E. Benjamin, M.D., Minneapolis, Minnesota 1009

In Memoriam 1011

Reports and Announcements.....1015

Of General Interest.....1016

Book Reviews 1020

Contents of Minnesota Medicine copyrighted by Minnesota State Medical Association, 1943

Entered at the Post Office in Minneapolis as second class mail matter. Accepted for mailing at the special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 13, 1918.

MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL ASSOCIATION

Published by the Association under the direction of its Editing and Publishing Committee

EDITING AND PUBLISHING COMMITTEE

E. M. HAMMES, Saint Paul
PHILIP F. DONOHUE, Saint Paul
H. W. MEYERDING, Rochester
H. A. ROUST, Montevideo
B. O. MORK, JR., Worthington
A. H. WELLS, Duluth
O. W. ROWE, Duluth
T. A. PEPPARD, Minneapolis
HENRY L. ULRICH, Minneapolis
C. L. OPPEGAARD, Crookston

EDITORIAL STAFF

CARL B. DRAKE, Saint Paul, Editor
GEORGE EARL, Saint Paul, Associate Editor
HENRY L. ULRICH, Minneapolis, Associate Editor

BUSINESS MANAGER

J. R. BRUCE

Annual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian Subscriptions—$3.50.

The right is reserved to reject material submitted for editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

Classified advertising—five cents a word; minimum charge, $1.00. Remittance should accompany order.

Display advertising rates on request.

Address all communications to Minnesota Medicine, 2642 University Avenue, Saint Paul, or National Bldg., Minneapolis. Telephone Nestor 2641.

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN



MAIN BUILDING—ONE OF THE 5 UNITS IN "COTTAGE PLAN"

A Modern Private Sanitarium for the Diagnosis, Care and Treatment of Nervous, Mental and Medical Cases

Located on beautiful Lake St. Croix, eighteen miles from the Twin Cities, it has the advantages of both City and County. Every facility for treatment provided, including recreational activities and occupational therapy under trained personnel. Milk, cream and butter from our own herd of Tuberculin-tested Registered Guernsey Cows. Inspection and coöperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

CONSULTING NEURO-PSYCHIATRISTS

Hewitt B. Hannah, M.D.
Joel C. Hultkrans, M.D.
511 Medical Arts Building
Minneapolis, Minnesota
Tel. MAin 4672

RESIDENT PHYSICIAN
Howard J. Laney, M.D.
Prescott, Wisconsin
Tel. 39

SUPERINTENDENT
Ella M. Mackie
Prescott, Wisconsin
Tel. 69

For infants and for children



Milk diffusible VITAMIN D *preparation*

DRISDOL in Propylene Glycol makes it possible to secure the benefits obtainable from combining vitamin D with the daily milk ration. This preparation is simple, convenient and easy to use, and relatively little is required for prophylaxis and treatment of rickets—*only two drops daily.*

DRISDOL IN PROPYLENE GLYCOL
DOES NOT FLOAT ON MILK • DOES NOT ADHERE TO BOTTLE
DOES NOT HAVE A FISHY TASTE • DOES NOT HAVE A FISHY ODOR

Drisdol in Propylene Glycol—10,000 units per Gram—is available in bottles containing 5 cc. and 50 cc. A special dropper delivering 250 U.S.P. vitamin D units per drop is supplied with each bottle.

D R I S D O L

Reg. U. S. Pat. Off. & Canada

I n P R O P Y L E N E G L Y C O L

***Brand* of Crystalline Vitamin D from ergosterol**

ARMY E NAVY

WINTHROP CHEMICAL COMPANY, INC.

NEW YORK 13, N. Y. *Pharmaceuticals of merit for the physician* WINDSOR, ONT.

Luzier Cosmetics and Allergy

Women use cosmetics because they have developed a need for them: they are essential to modern standards of good-grooming and therefore contribute to a sense of well-being. Your patient's appearance, viewed cosmetically, is a factor that deserves your consideration both during hospitalization and convalescence. Cosmetics cannot lift faces, but they certainly perform wonders when it comes to lifting a woman's spirits. Women have an instinctive desire to look pretty and to smell sweet.

Since cosmetics are so universally used it is not to be wondered that they sometimes figure in the field of allergy. We venture the opinion, however, that cosmetics figure less frequently in this field than many common foodstuffs, and certainly no more frequently than many articles of clothing. Many a contact dermatitis that might formerly have been ascribed to cosmetics is now traced to dog dander, house dust, elm sap, bed linen, etc.

While our products are free from so-called common cosmetic allergens, such as orris root and rice starch, we feel it should be made clear that any of their normally innocuous ingredients might be allergenic to the allergic individual. That is why when there is a history of allergy we suggest that patch tests be made with those of our products the subject is using or contemplates using. If they test positive, further testing with their constituents is indicated to determine the offending agents. These found, we frequently can modify our formulas to suit the subject's requirements.

Luzier's Fine Cosmetics and Perfumes Are Distributed In Minnesota By:

District Distributors

Louise Roberts
304 Medical Arts Bldg.
Minneapolis, Minn.

Mae Nagle
Ormonde Hotel
Virginia, Minn.

Kay McCarthy
Madelia, Minn.

Assistant District Distributor

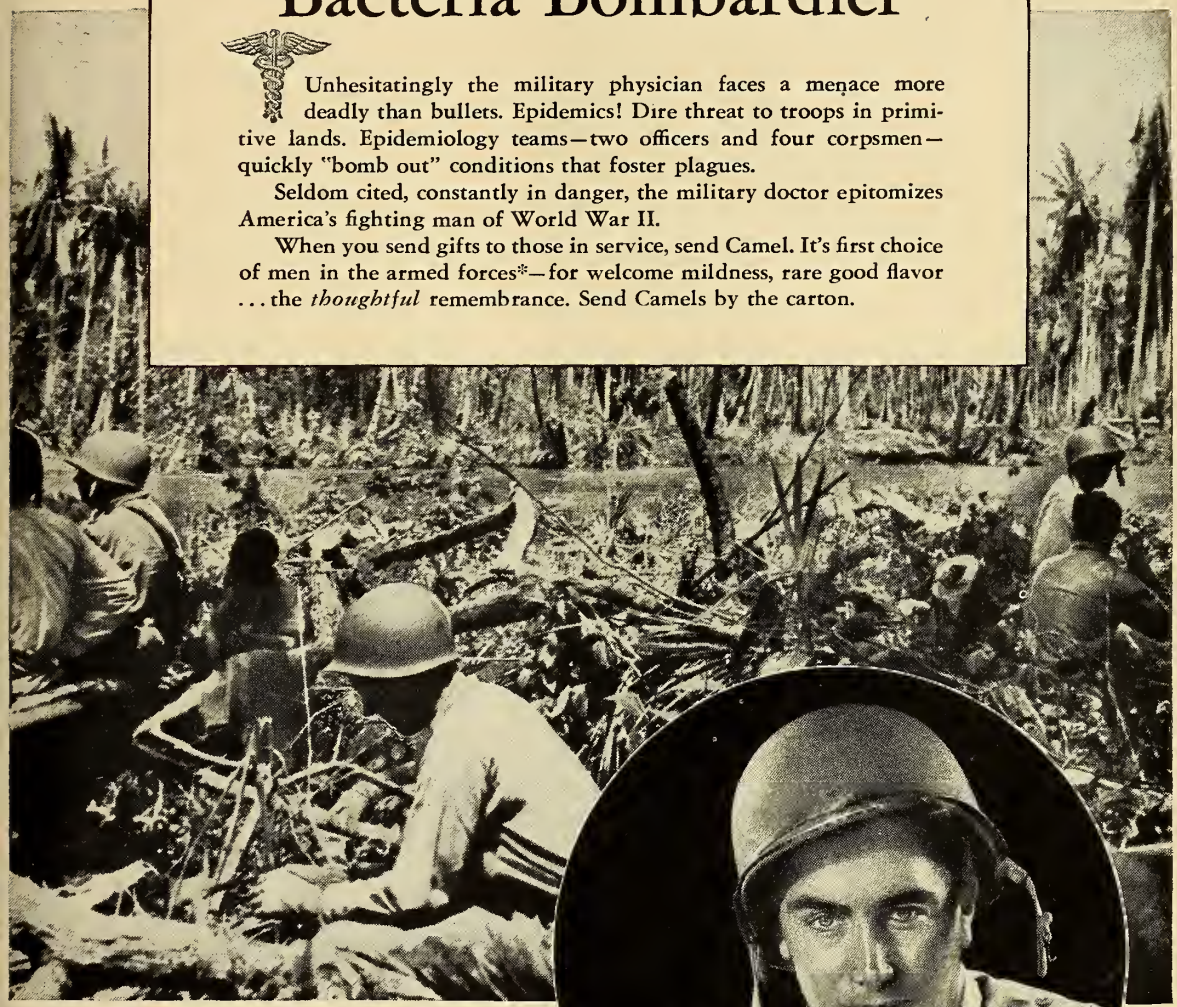
Eva Byrne
610 3rd St. S.E.
Little Falls, Minn.

Bacteria Bombardier

Unhesitatingly the military physician faces a menace more deadly than bullets. Epidemics! Dire threat to troops in primitive lands. Epidemiology teams—two officers and four corpsmen—quickly "bomb out" conditions that foster plagues.

Seldom cited, constantly in danger, the military doctor epitomizes America's fighting man of World War II.

When you send gifts to those in service, send Camel. It's first choice of men in the armed forces*—for welcome mildness, rare good flavor ... the *thoughtful* remembrance. Send Camels by the carton.



FIRST in the Service

*With men in the Army, Navy, Marine Corps, and Coast Guard, the favorite cigarette is Camel. (Based on actual sales records.)



Camel

Costlier Tobaccos

New reprint available on cigarette research—Archives of Otolaryngology, March, 1943, pp. 404-410. Copies on request. Camel Cigarettes, Medical Relations Division, 1 Pershing Square, New York 17, N. Y.

AHEAD OF THEM ALL IN QUALITY







ULMER Quality

All ULMER QUALITY Products represent ethical development of leading medical men and conform to U.S.P., N.F. or other accepted standards.

ALL ULMER QUALITY Pharmaceuticals are manufactured in our modern air-conditioned laboratory under strict scientific control, from the highest grade raw materials available, assuring medicinal products of high quality and uniformity. Skilled chemists and pharmacists in coöperation with members of the medical profession develop, test and produce all ULMER QUALITY Products. Only graduate chemists and pharmacists manufacture our products. The sterility of intravenous and similar products is assured by careful bacteriologic tests. The line of ULMER QUALITY Products includes ointments, elixirs, syrups, tablets, capsules and specialties manufactured for the exclusive use of the medical profession. We do not advertise to the laity. A complete list of all ULMER QUALITY Products appears in your Ulmer Pharmacal catalog. If you have mislaid it let us know and we will send you another. For your own satisfaction and protection use and prescribe ULMER QUALITY Products.

PHYSICIANS and HOSPITALS SUPPLY COMPANY Inc.



Announcement

We have been appointed distributors for the Michael Reese Research Foundation NORMAL HUMAN PLASMA AND SERUM —undiluted and diluted with normal saline. Accepted by the American Medical Association—in stock for prompt shipment. You run no risk—plasma and serum returnable for exchange at expiration date. Order today—keep a supply always on hand.

"Shock" demands Speed!

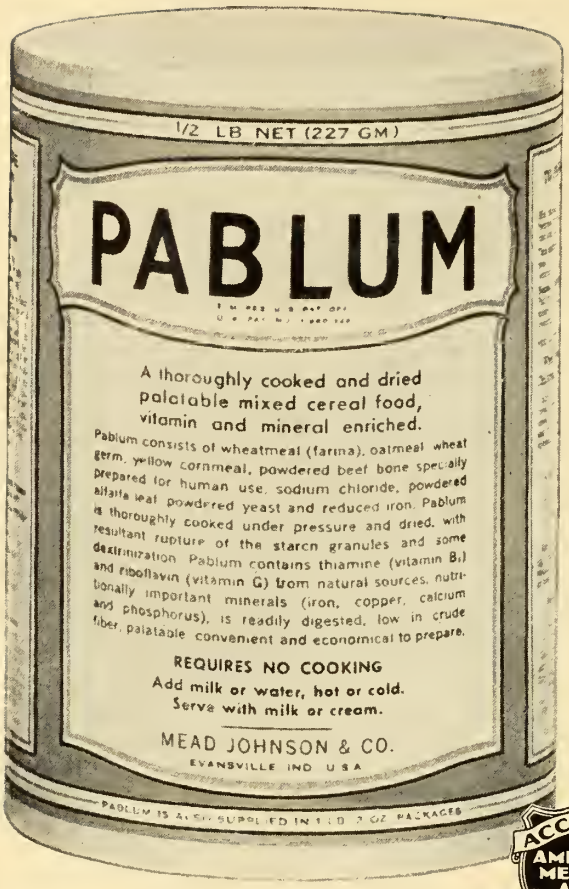
C. F. ANDERSON CO. INC.

Surgical & Hospital Equipment

Minneapolis • 901 Marquette Ave. • Minnesota

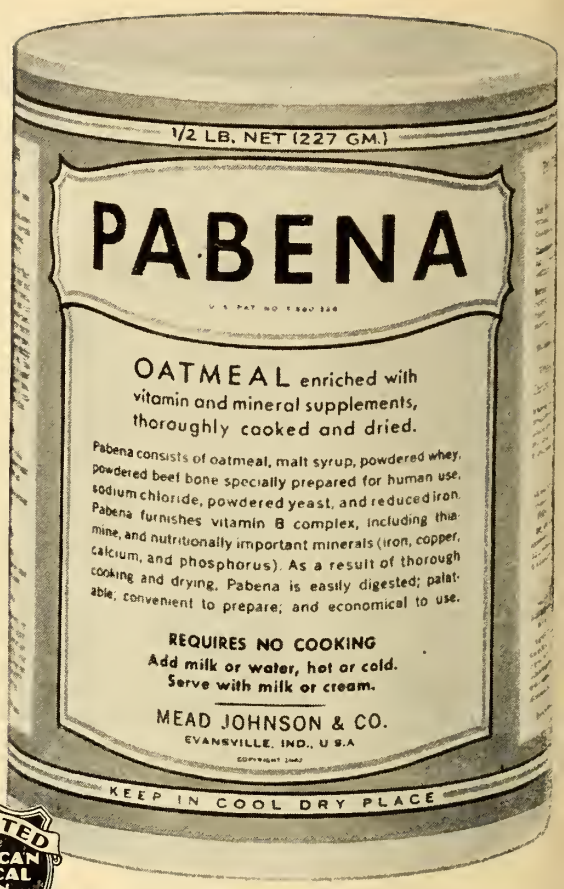
Established 1919

1932 1942



8 oz.—1 lb. 2 oz.

ACCEPTED AMERICAN MEDICAL ASSN. Council on Foods

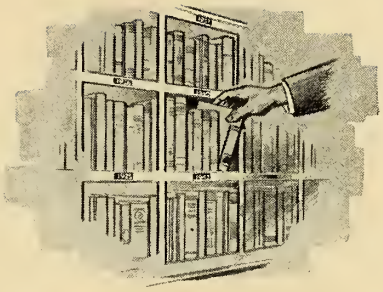


8 oz. only

PABLUM, the pioneer precooked fortified infant cereal, now has a companion-product: Pabena is a precooked oatmeal cereal, lending variety to the infant's diet and offering the nutritional and convenient features of Pablum.

BOTH continue to be marketed and advertised only to the medical profession. Samples available on physicians' requests.

MEAD JOHNSON & CO., EVANSVILLE, IND., U.S.A.



A wealth of clinical evidence

makes this low-toxicity vasoconstrictor a favored prescription for quick, sustained nasal decongestion without appreciable adverse local or systemic side effects

Neo-Synephrine Hydrochloride

(*laevo-α-hydroxy-β-methylamino-3-hydroxy-ethylbenzene-hydrochloride*)



Accepted
American Medical Ass'n
Council on Pharmacy and Chemistry

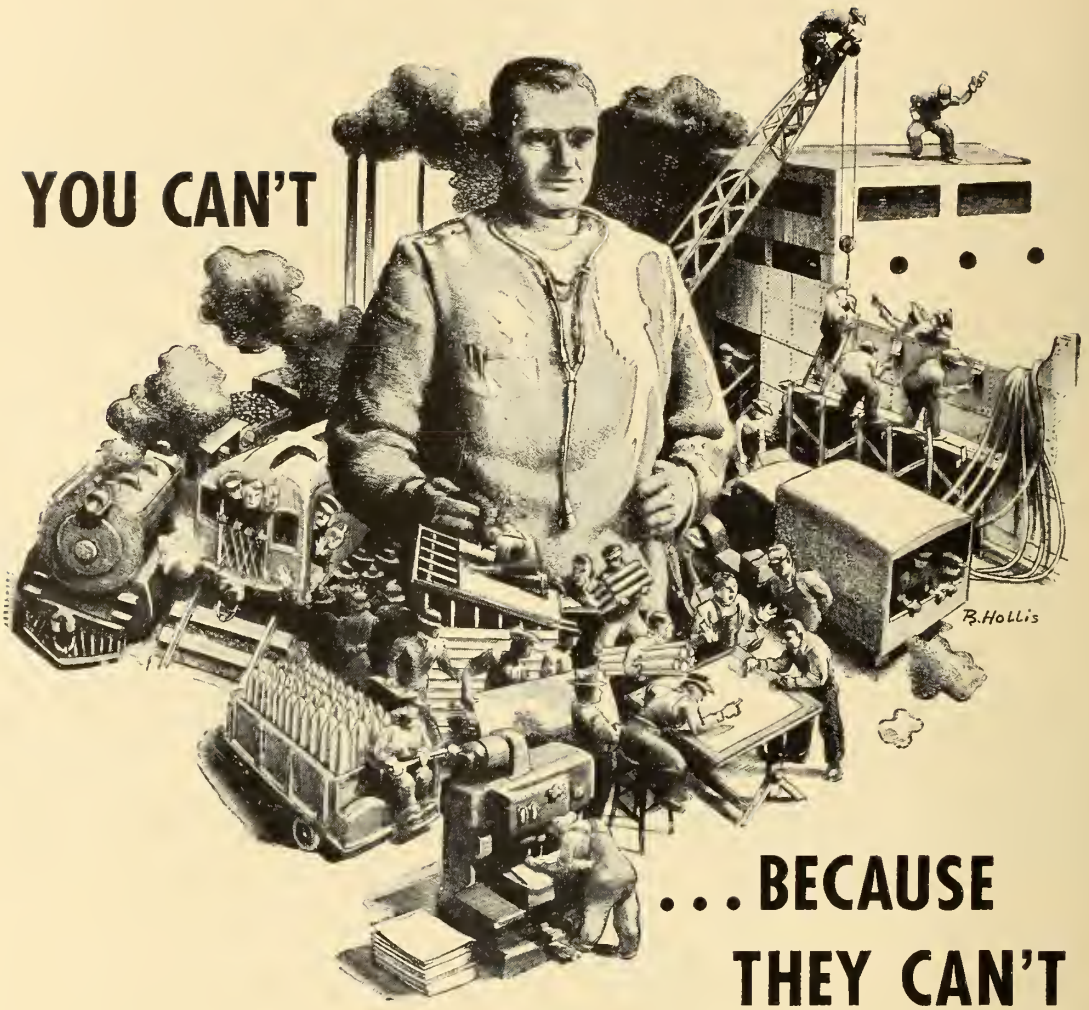
Available in a ¼% or 1% solution in 1-oz. bottles for dropper or spray; and as a ½% jelly in collapsible tube with applicator.

Frederick Stearns & Company

Since 1855 . . . ESSENTIALS OF THE PHYSICIAN'S ARMAMENTARIUM

NEW YORK KANSAS CITY SAN FRANCISCO **DETROIT, MICH.** WINDSOR, ONTARIO SYDNEY, AUSTRALIA AUCKLAND, NEW ZEALAND

YOU CAN'T



. . . BECAUSE THEY CAN'T

Often, today, the physician can't get his head-cold patients to go to bed—because they can't, or feel they can't, absent themselves from essential war work. But he *can* do much to help these patients. He can give them marked comfort and relief by prescribing BENZEDRINE INHALER.



Benzedrine Inhaler is so outstandingly convenient that the physician may overlook the fact that it is, first and foremost, a highly effective therapeutic agent.

BENZEDRINE INHALER

A VOLATILE VASOCONSTRICTOR

In a Modern Plastic Tube

Each tube is packed with racemic amphetamine, 250 mg.; oil of lavender, 75 mg.; menthal, 12.5 mg.
Benzedrine is S.K.F.'s trademark, Reg. U. S. Pat. Off.

SMITH, KLINE & FRENCH LABORATORIES, PHILADELPHIA, PA.

Note to an overworked doctor



BIOLAC is a complete liquid infant formula which saves you valuable time because there are no extra ingredients to calculate.

Biolac provides completely for all nutritional needs of young infants except vitamin C.

Prescribing Biolac reduces the possibility of errors or contamination in formula preparation since it requires simply dilution with boiled water as you direct.

NO LACK IN BIOLAC

Borden's complete infant formula

• *Biolac is prepared from whole milk, skim milk, lactose, Vitamin B_1, concentrate of Vitamins A and D from cod liver oil, and ferric citrate. It is evaporated, homogenized, and* sterilized. *For professional information, write Borden's Prescription Products Division, 350 Madison Avenue, New York City.*

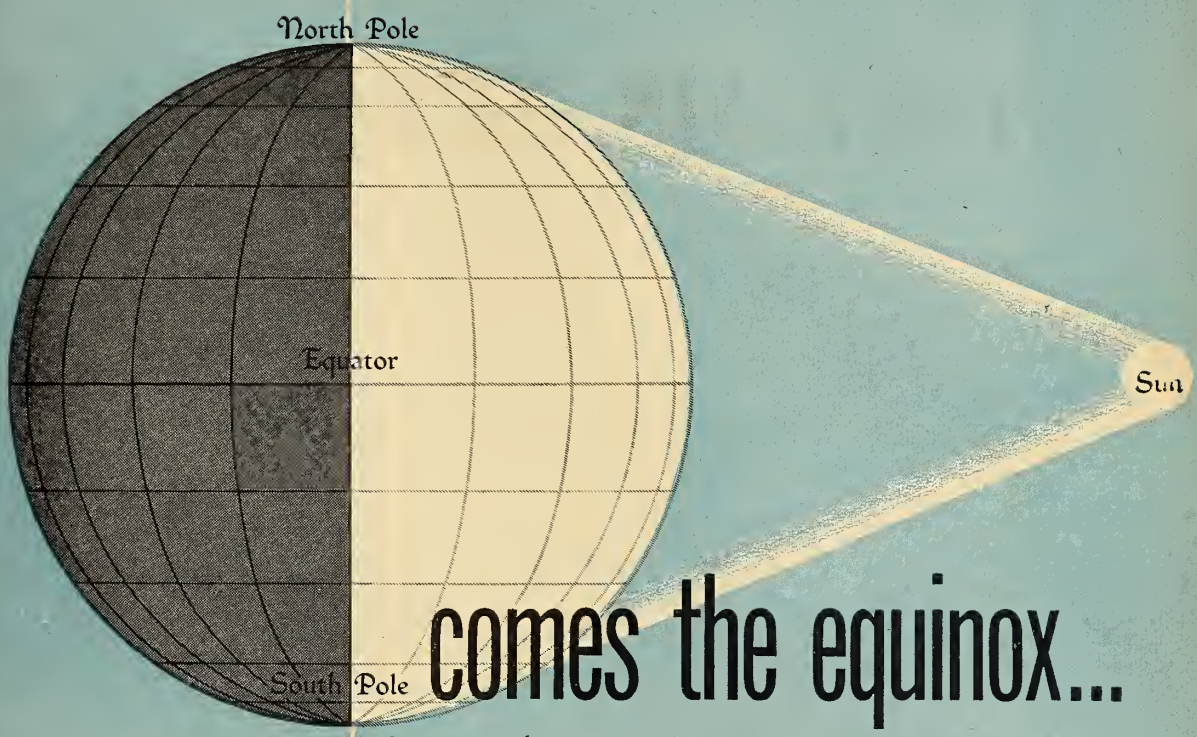
ACCEPTED AMERICAN MEDICAL ASS'N

TESTED...
AND PROVED



*measurably
LESS IRRITATING
to the Nose and Throat

** Reprints of studies on the irritant properties of cigarettes are available. Address your request to Philip Morris & Co. Ltd., Inc., 119 Fifth Avenue, New York.*



comes the equinox...

and with the change of season comes an increased need for the vitamins of cod liver which are provided in

White's cod liver oil concentrate

White's Cod Liver Oil Concentrate presents the *natural* vitamins A and D derived only from cod liver oil itself—in the proportions found in U.S.P. cod liver oil.

Free from excess fatty oils and bulk, it provides three pleasant, simple dosage forms for prescribing the A and D vitamins of cod liver oil for your various patients—infants, growing children, adults:

Liquid—for drop dosage to infants.

Tablets—pleasantly flavored—children may chew them.

Capsules—where larger dosage is indicated.

Economical—In contrast to the high current retail cost of plain cod liver oil, White's Cod Liver Oil Concentrate provides potency at an economical price. Prophylactic antirachitic dosage for infants costs less than a penny per day.

Ethically promoted—not advertised to the laity. White Laboratories, Inc., Pharmaceutical Manufacturers, Newark 7, N. J.

ACCEPTED AMERICAN MEDICAL ASSN Council on Pharmacy and Chemistry

℞

White's PRESCRIPTION vitamins

PYOKTANIN SURGICAL GUT

Plain and Formalized

Manufactured Since 1899 by

The Laboratory of the Ramsey County Medical Society

Packaged dry in hermetically sealed glass tubes in accordance with the new requirements of the U. S. Pharmacopœia.

• • •

Price List

PLAIN TYPE A NONBOILABLE
AND
FORMALIZED TYPE C NONBOILABLE

Sizes.....000 — 00 — 0 — 1 — 2 — 3
28 inches.....per dozen strands $2.00
60 inches.....per dozen strands $3.00

Special discount to hospitals and to the trade. Cash must accompany the order.

• • •

Address

LABORATORY RAMSEY COUNTY MEDICAL SOCIETY

Lowry Medical Arts Building, St. Paul, Minnesota

FOR SALE BY SURGICAL DEALERS AND DRUGGISTS

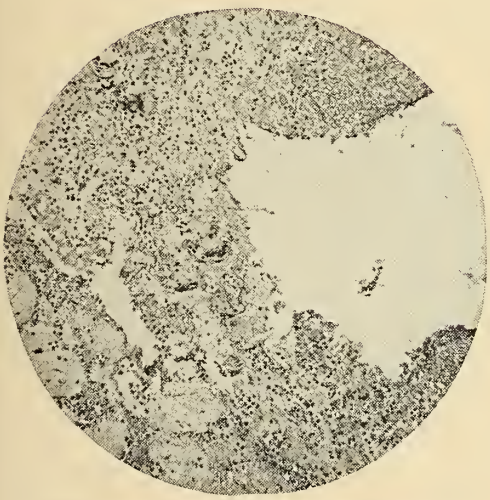
Bacillary Dysentery in Adults . . .

SULFAGUANIDINE

Lederle

THE SERIOUS PATHOLOGY of the colon and rectum, frequently found following severe acute bacillary dysentery in adults, may be averted by the early oral administration of sulfaguanidine.

The use of sulfaguanidine for the treatment of dysentery carriers has been suggested.



Photomicrograph showing cytological detail in acute lesion of mucosa of colon. Magnification x 650.

REFERENCES:

LYON, G. M.; FOLSOM, T. G.; PARSONS, W. J., and SPROUSE, I: West Virginia M. J. 38:19 (Jan.) 1942.

LYON, G. M.: U. S. Nav. M. Bull. 40:601 (July) 1942.

BREWER, A. E.: Brit. M. J. 1:36 (Jan. 9) 1943.

FAIRLY, N. H., and BOYD, J. S. K.: Brit. M. J. 2:673 (Dec. 5) 1942. (Proc., Royal Society of Tropical Medicine and Hygiene, Nov. 4, 1942).

BULMER, E., and PRIEST, W. M.: J. Roy. Army M. Corps 79:277 (Dec.) 1942.

RANTZ, L. A., and KIRBY, W. M. M.: J. A. M. A. 118:1268 (Apr. 11) 1942.

OPPER, L., and HALE, V.: J. A. M. A. 119:1489 (August 29) 1942.

KUHNS, D. M.: South. M. J. 36:593 (June) 1943.



Photomicrograph of Dysentery Bacillus—Flexner—(*Shigella paradysenteriae*) Initial magnification x 1300.

PACKAGES: Bottles of 50, 100, and 1000 tablets, 0.5 Gm. (7.7 grains) each.

ARMY E NAVY

LEDERLE LABORATORIES A UNIT OF AMERICAN CYANAMID COMPANY INC.

30 ROCKEFELLER PLAZA, NEW YORK 20 NEW YORK

P. I. *and* A.

PROTECTS INVESTMENTS IN FINE X-RAY EQUIPMENT

For more than thirteen years General Electric's *Periodic Inspection and Adjustment Service* has been demonstrating its value and importance to owners of fine x-ray equipment everywhere. For this personalized field service was instituted with these objectives:

To keep apparatus tuned up to its highest operating efficiency

To detect and correct electrical and mechanical deficiencies as they arise, and thereby preclude costly repairs due to inadvertent neglect

To minimize loss of valuable time due to inoperative equipment undergoing repair

To further assure a consistently high quality of professional service

Today, operators of hundreds of x-ray laboratories where *P. I. and A. Service* is contracted for year after year, deem it more important than ever, since it not only continues to protect their investment in equipment, but also helps them to carry out the government's desire: That all available x-ray equipment be maintained at its best, so that it may be utilized to full working capacity, to meet the abnormal demands for diagnostic service on our home front.

The idea of *P. I. and A. Service* was conceived years before the War, and will carry on long after this emergency period is past. G-E's permanently established, nationwide organization of branch offices justifies this assurance to present and future x-ray users.

The next time your local G-E representative calls, ask him to tell you more about "P. I. and A."

ARMY E NAVY

Today's Best Buy — U. S. War Bonds

GENERAL ELECTRIC X-RAY CORPORATION

2012 JACKSON BLVD. CHICAGO (12), ILL., U. S. A.

"Till He Comes Marching Home"





THE lonely lad sleeping in a foxhole remembers Mother as she was when he choked back the lump in his throat to kiss her goodbye for the last time. He does not realize that she may change, physically and psychically. To him she remains the same . . . always.

When he returns a great part of his dream can come true because THEELIN, an estrogen with a brilliant record of effectiveness, gives to many mothers in the climacterium continued relief from menopausal symptoms often intensified by the stress and worry of wartime living. Psychotic manifestations and somatic disturbances associated with ovarian hypofunction usually respond to the governing influence of this pure, crystalline estrogenic substance obtained from pregnancy urine. Its record of therapeutic usefulness and comparative freedom from undesirable side reactions has been proved by millions of doses and hundreds of published papers.

For sustained therapy between injections and for controlling milder menopausal symptoms THEELOL Kapseals* and THEELIN Suppositories are supplied. The latter may also be used in gonorrheal vaginitis in children.

Supplied as: THEELIN AMPOULES—in 1000, 2000, 5000 and 10,000 I. U. in oil, or in 20,000 I. U. in aqueous suspension • THEELOL KAPSEALS—in .12 and .24 mg. of Theelol • THEELIN SUPPOSITORIES—in 2000 I. U. of Theelin.

*Trade-Mark Reg. U. S. Pat. Off.

THEELIN

A product of modern research offered to the medical profession by

PARKE, DAVIS & COMPANY

DETROIT, MICHIGAN

Step toward Perfection



CRUDE DRUGS and chemicals procured for the preparation of Lilly products must measure up to highest standards. Assays from outside sources, no matter how reliable, never are accepted without confirmation from the Lilly control laboratories.

Lilly

ELI LILLY AND COMPANY

INDIANAPOLIS 6, INDIANA, U. S. A.

BUY WAR BONDS AND STAMPS

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 November, 1943 No. 11

WHITE BILE

ARNOLD SCHWYZER, M.D.

Saint Paul, Minnesota

"WHITE bile" is a misnomer, but it designates so quickly what otherwise would require a rather cumbersome designation that it appears to stand. The fluid encountered in these cases is at times whitish, but even more often a thin colorless liquid like water; so much so that one writer[3] states that at the first moment on aspirating from the hepatic duct he thought the aspirated liquid was cerebro-spinal fluid. The so-called white bile is, therefore, often not white and it is not bile. However, the fluid is in the place where normally bile is found. Hydrops of the gall bladder is not considered here. It is a relatively trivial condition. We are only discussing the much more serious cases where the bile *ducts* contain the mentioned fluid.

"White bile" is greatly dreaded by the surgeon because it tells us that the liver has stopped its normal excretory action. Bile is partly an excretion and partly a secretion. The liver function is complicated and manifold. Life may go on for a considerable length of time in a case of icterus though the bile channels be tightly blocked, because the production of bile goes on with the bile being discharged into the blood. In such a case it is excreted at least partly with the urine and a little through perspiration. But white bile is also encountered in cases where the liver has ceased functioning or at least a high degree of functional disturbance has been reached. This is particularly seen in some cases of general overwhelming sepsis where white bile is at times encountered without any demonstrable obstruction of the bile channels. The cause of white bile in these cases is a grave toxic damage to the liver parenchyma which has become too disintegrated for bile production. The patient dies of sepsis without or with only moderate icterus, and it is thus merely a finding at the autopsy overshadowed by devastating septic processes in other parts of the body.

LaManna[4] reported in 1936 nine cases of white bile from the pathological institute of the University of Berlin. Of these nine cases four had complete obstruction and severe icterus, while the other five were varied forms of sepsis with no obstacle in the bile channels. It is noteworthy that out of these five septic cases with no obstruction to the flow of bile, four were babies of from two and a half weeks to two years of age. In the case of the newborn this may be explained by the fact that the liver at birth is easily injured when exposed to unduly violent forces acting on this delicately structured and at the same time very bulky organ. Add to this a sepsis usually starting from the navel (umbilical vein), and the occurrence of disintegration of the liver parenchyma in such babies is readily intelligible.

It is important to differentiate between these two separate and distinct types in the white bile cases. The one is due to sepsis which disintegrates the liver parenchyma and causes a true cessation of any bile secretion, a true acholia. These cases are only seen on the autopsy tables, and the icterus is not deep, nor a prominent feature in the picture. The second type is due to obstruction, where the bile producing ability of the liver is only hampered but not destroyed

except in the long end. The bile is discharged partly, and under difficulty, into the blood stream. This form of white bile is therefore not due to a true acholia but to a paracholia.

The white bile with which the surgeon comes in contact is caused by obstruction. The fundamental reason for the occurrence of this quite rare condition is not well understood inasmuch as severe obstructive icterus with dark bile is so often seen. Does white bile occur only after a great length of time during which obstruction is present? This explanation is not satisfactory and experiments on animals contradict it. Furthermore we see quite often cases of long standing with a regular olive colored skin come to operation, but white bile is rarely seen.

Among 1,064 operations on the biliary passages in my private practice only nine cases of white bile were encountered, and one of them does not even strictly belong here as we shall see later.

While earlier authors had seen white bile only in obstruction by tumors this had to be revised later on. Malaguti (cited by LaManna) collected 143 cases of white bile and found stones as cause of the obstruction in 46.8 per cent, while only in 34.5 per cent neoplasms. Some cases had only localized inflammations, stenosing scars or tuberculous portal lymph nodes or even only kinks in the extra-hepatic channels. Many reported surgical cases of white bile had an obstruction more or less complete, and especially for a considerable time. Have we then a gradually developing exhaustion of the liver, leading to a similar end result as in the rapid exhaustion by overpowering sepsis? No. This cannot be at the bottom of the condition if stated in a sweeping way, because in the majority of the observed cases, the liver resumed a quite normal secretory activity within a day or even less after the obstruction was removed. The parenchyma had only been hampered mechanically from expelling its secretion through normal channels. Notwithstanding continuous elimination of bile through the urine the icterus had stayed at its height or appeared to become even more intense before the operation; the liver, therefore, must have continued some of its activity up to the time of operation. Before operation we have no means of finding out if there is white bile, and therefore, most always we do not know how long the contents of the ducts have been "white."

Rous and McMaster, Bernhard and Aronson experimented on animals, where, by ligation of the ducts, white bile was at times observed. The earliest appearance of white bile is found in the reports of Rous and McMaster where this change occurred as early as after eight days while Valdoni (LaManna) and Aronson[1] saw it only after two to four months in dogs. Mostly it took at least three or four weeks as I deduce from the reports. In one of our cases (No. 6) it took less than two weeks after the first signs of icterus. The liver need not be very severely damaged. So one reads in Bernhard's article[2] that dextrose and galactose tolerance tests showed no perceptible damage to this part of liver function. However, we have clinically different outcomes. There are the favorable ones with prompt resumption of apparently all the liver function and full recovery. On the other hand, when bile of normal color does not come forth at the end of thirty-six hours and especially after forty-eight hours, the prognosis becomes very serious. I have seen recovery in a case where proper bile appeared as late as thirty-six hours after draining the duct, but another case of mine died after four days with no colored bile showing up. Judd saw normal bile appearing even after four days. Some earlier authors thought that white bile was due to a reflux of pancreatic secretion. The only authentic case of this kind I happen to know of was in my own practice and will be reported below: but, to say it beforehand, the condition was something entirely different from that under discussion.

Why should the contents of the bile channels become entirely colorless? At the time when obstruction occurs the ducts must have been engorged with normal, probably dark bile. Where does the coloring matter go? Was it absorbed or disintegrated, or both? Bernard accuses the leukocytes for the disintegration, but this is untenable where the contents are perfectly water-colored as in a case reported for instance by Lake of London and in one of ours which will be discussed. Aschoff and LaManna, as pathologists, and many clinicians following Naunyn give infection the first place as the underlying cause for the formation of white bile. In their book on "Diseases of the Gall Bladder and Bile Ducts" (1940) Walters and Snell[9] say on Page 47, "White bile . . . probably represents a true pathologic biliary hypersecretion."

It seemed of interest to give this picture of divergent views as one encounters it in the surgical literature where the numerous and classical experiments of Rous and McMaster are apparently not properly considered. Rous and McMaster[7] have cleared up the problem in a thorough manner and have proven that infection plays no role or only a very secondary one. They produced the picture of white bile in dogs, cats and monkeys under perfectly aseptic conditions where plate cultures remained sterile. They saw all stages of alteration from green to colorless bile. When the gall bladder was left in communication with the tied off main bile duct, absorption of fluid could take place in the gall bladder and the bile became inspissated. A certain amont of bile secretion into the blocked ducts was therefore possible for a longer time than in experiments where the gall bladder was removed or excluded otherwise. When the resorptive action of the gall bladder persisted the bilirubin changed into the much darker biliverdin by oxidation which (at least partly) simulated a concentration. The question naturally comes to you: Why is white bile observed so rarely in our surgical work while severe obstructive icterus of long standing is seen so frequently? Perhaps general constitutional differences as well as local factors come into play. The answer would therefore be purely speculative at the present time. But as to the origin of colorless bile in obstruction of the ducts McMaster and his co-workers have definitely settled the question. They ligated ducts above and below; the isolated segment became distended with a thin colorless fluid, watery or thinly mucinous. Cultures were sterile. The segment became greatly distended. This secretion, therefore, was going on notwithstanding considerable intra-ductal pressure. A strip of duct 2 cm. long between the two ligations yielded 8.5 c.c. of fluid in six days, surely a surprising amount. In eleven dogs with total obstruction lasting eight to twenty-seven days the contents of the main channels were entirely colorless. The same was observed on cats after eleven to fourteen days. Cholesterol was practically absent. This disappearance of the originally present bile cannot have been caused in such short a time by disintegration or by leukocyte activity as some authors contend. On the other hand an absorption of bile salts, pigment or cholesterol does not occur even in the gall bladder. Where a complete blocking is caused by some absolute obstacle there must be a place of escape for the originally present real bile. It must be forced out somewhere (and at the same time gradually diluted) by the colorless thin secretion of the bile channels. It is of interest that already long ago (in 1868) Heidenhain made physiological studies on absorption from the bile channels and the escape of bile in obstruction (Rous and McMaster, also Herrman, "Physiologie"). He located the site of escape of entrapped bile at the junction of the intralobular bile capillaries with the collecting ductlets in Glisson's septa. Buerker finds it practically at the same place, i.e., in the peripheral area of the liver lobules. It stands to reason that when the biliary secreting pressure is exceeded by that of the ducts, the very delicate bile capillaries must give way.

I should consider the happenings to be about as follows: The obstruction in a case of carcinoma develops gradually. The pressure in the ducts increases and, as Rous and McMaster have shown, the liver secretion becomes poorer in the essential ingredients. As the biliary secretory pressure is quite low (24 mm. H_2O) the flow of bile ceases at a moment when the pressure in the ducts exceeds this point. The ducts with their higher secretory force still go on pouring out their colorless fluid. With this increased pressure the contents of the bile ducts can still be forced through the obstacle and thus the contents of the channels are gradually thinned out and become paler and paler until complete stoppage takes place. Where sudden complete obstruction occurs as in the case of calculi, absorption at the periphery of the liver lobules will have the same effect of a gradual dilution and finally replacement of bile by the colorless secretion from the ducts. The two modes of exit may of course be combined in some cases.

My experience with white bile as mentioned before is limited to nine cases. Four of them offer nothing of further value than that in two of them normal bile appeared on the evening of the day of operation, in another after twenty-four hours, and in the fourth one after thirty-six hours. They recovered fully. A fifth one died of cholemia after barely four days without return of normal bile, not even the slightest coloring.

Case 6.—Mr. J. B. H., a printer, sixty-five years old, gave in short the following history: He had suffered from no serious illness prior to the present one which

had started in the later part of June, 1939, with epigastric pain, vomiting and diarrhea. His surgeon sent him to the hospital on August 9 for closer study. The leukocytes were 11,350 on August 10 and six days later came down to 8,000. Throat, chest, abdomen and urine gave no further clue. An x-ray study of the gall bladder revealed a very large gall bladder with poor concentration of the dye. There was no jaundice.

He was operated upon August 19. A large, very tense congested gall bladder was found which had to be aspirated before it could be gotten hold of. One hundred c.c. of tarry bile were evacuated in this manner. Stomach and duodenum were normal. The gall bladder was removed. No stones were present. The cystic duct was small. Palpation of the deeper ducts revealed nothing further. The thickened appendix was then taken away and the abdomen closed. The pathologist's report reads (in part): Gall-bladder wall considerably thickened. A few lymphocytes under the epithelium and in muscularis: chronic cholecystitis. The operative course at first was very smooth. The temperature after a slight rise on the day following the operation never reached higher than 98.6 degrees, and on August 28 the patient was allowed to leave the hospital. At home he did not do well. The old epigastric distress persisted and gradually increased. When a slight jaundice became evident his surgeon had him readmitted to the hospital on September 11. The leukocytes were 7,750 and the hemoglobin 81 per cent. The roentgenologist was unable to demonstrate any abnormality in the region of the papilla of Vater. I was then asked to see the patient in consultation on September 16, 1939. He was cachectic looking and emaciated. The feces were clay-colored, and the dark urine contained much bile. The bleeding time was 3.5 minutes and coagulation time 6.5 minutes. As the icterus was increasing and the sensorium had become somewhat blurred, operation without much delay was necessary. On September 18, thirty days after the first operation, we reopened the abdomen under spinal anesthesia.* After dividing the adhesions we noticed in the region of the hepatic duct a bulging which fluctuated and was of the size of a distended jejunum. Through a fine needle 85 c.c. of a very thin water-colored fluid were withdrawn. Having only a 20 c.c. syringe at hand the needle punctured the wall four times which was undoubtedly the reason we later found a few blood cells in the centrifuged liquid. An incision was made and more fluid removed. The inside of the duct was smooth and entirely white, in striking contrast with all the bile-stained surrounding tissues. A curved uterine sound was worked around some folds upward and finally entered the right and then the left hepatic duct. We could now feel certain that we had to deal with an enormously dilated hepatic and common duct. But we were not able at first to enter far downward on account of a number of folds which had formed after the evacuation. With blunt artery clamps these folds were then taken hold of as they came into view. Crawling thus downward from fold to fold on the inside of the duct the lower portions of it became stretched and finally the probe under some force entered the duodenum. Though suspecting it, we could not make out a definite sign of neoplasm. Immediately upon withdrawal of the probe a small caliber catheter was introduced and pushed some inches through the papilla. In addition a medium sized catheter was laid into the duct which was then closed around the two tubes with fine catgut. A collapsible rubber drain was placed in the neighborhood of the opeing in the duct, and the abdomen closed.

The postoperative course was afebrile. The pain was temporarily relieved, and with the rapid decrease of the jaundice, the sensorium became more free. Six days after the operation the catheter which led through the ampulla was removed and on the eleventh day the tube leading into the dilated duct was withdrawn. Bile then escaped profusely for a few days, but soon ceased. The patient died, however, after about five weeks and the autopsy revealed a carcinoma of the head of the pancreas.

Case 7.—This was similar to the foregoing case. However, the great enlargement of the duct had existed already at the time of the first operation and as the gall bladder containing no stones did not appear changed apart from being large, it had not been removed. The duct was the size of a man's wrist according to the surgeon's report. The operation had taken place on August 14, 1939. On incision "a very large amount of white bile gushed out. What came first was clear-like water but was followed by more whitish fluid. Similar fluid came forth when the gall bladder was compressed." Under considerable difficulty a probe could be inserted through the ampulla, which the surgeon then dilated. No pathology could be made out and the pancreas gave no evidence of a tumor. The duct was drained. Before the abdomen was closed, colored bile appeared. The patient was discharged on September 11. She was readmitted on October 6 as she suffered from a great deal of pain and was steadily losing ground. When I first saw her on October 30, she had vomited practically everything for many days and had been kept alive only by repeated blood transfusions and glucose intravenously. X-ray examination demonstrated a complete duodenal obstruction low on the descending portion. The only chance was a gastro-enterostomy which was made, and at that time a large mass in the pancreas was felt. But the patient succumbed a few days later from exhaustion. The diagnosis of carcinoma of the pancreas was confirmed at autopsy.

In this case there had been a free communication between the gall bladder and the common duct, which Rous and McMaster found to delay the formation of white bile because the gall bladder has marked absorbing qualities and thus takes care of part of the over-pressure. This could delay the formation of white bile, but it did not prevent it.

Rous and McMaster's experiments showed that

if the common duct was obstructed for twelve to fourteen days with a normal gall bladder present, green fluid was found in the ducts. If the gall bladder was functionless or had been removed, they found white bile to have formed after the same length of time, i.e., twelve to fourteen days. Where white bile was encountered in the presence of a gall bladder, these authors consider the gall bladder to be functionless like a simple diverticulum of the ducts.

Case 8.—In this case I only had the opportunity to see the autopsy. The gall bladder had been removed nineteen and one-half years previously. Death had followed one month after an operation of draining the common duct in severe icterus. White or rather absolutely colorless bile had been aspirated from the duct which was of 1-inch diameter. The autopsy revealed a constricting carcinoma of the pancreas. There were no signs of peritonitis. The interesting feature was that though normally colored bile appeared thirty-six hours after the operation, and the bile fistula was kept open, the severe icterus did not recede. There was a reasonable output of bile, up to 550 c.c. in twenty-four hours, a rather small quantity for a muscular man who took nourishment. The amount of bile gradually decreased later on. The liver was not cirrhotic, it was only dark as one would expect. The biliary fistula was wide open and the ducts were freely patent when followed into the liver. But the icterus had remained very deep. We had here, therefore, a degree of damage to the liver through the pre-operatively existing biliary obstruction which almost—but only almost—permitted recovery of the liver function. The condition of the liver, one might say, was on the fence, and gradually began to lean the wrong way. And this notwithstanding reappearance of bile thirty-six hours after relieving the intraductal overpressure.

The next was a very exceptional case, as we were confronted with a spurious form of "white bile." The story is the following:

Case 9.—Mr. J. B. S., forty-one years old, had a posterior gastro-enterostomy for supposed duodenal ulcer in May, 1930. The findings were not entirely definite according to the suregon's statement, and the patient was no better after that. Nine months later, in February, 1931, he came to us with symptoms of great distress which pointed strongly to the gall bladder. An x-ray examination, made elsewhere, found the gall bladder to be "abnormal." On February 10, 1931, the gall bladder was removed. We encountered an undue amount of adhesions. The gastro-enterostomy, we knew from our x-ray study, functioned and showed no flecks. The excised gall bladder on examination disclosed microscopically a round cell infiltration in the muscular coat, quite marked in some areas. Bacteriologically microörganisms of the colon group were cultured from the wall of the gall bladder. Recovery was prompt, but six months after the operation an attack of severe pain came on. It blew over. There was no jaundice, and the patient was then completely well for two years. He was again admitted to the hospital on October 16, 1933. Since August, 1933, repeated attacks (about five in all) of severe pain in the region of the gall bladder had occurred with clay-colored stools, dark urine, moderate but definite jaundice and pruritus. The condition looked like an intermittent obstruction of the common duct due to stone. The note was made that the present attack had started four days before admission with an exacerbation two days later after the noon meal consisting of soup and a sandwich. Since October 5, when he had an attack previous to this last one, jaundice persisted.

On October 18, 1933, we re-opened the abdomen. The temperature on the two preceding days had ranged between 99.5 and 100.5 degrees. Diffuse and widespread adhesions were again encountered. The pancreas was so hard and bulky that it was decided to snip a small piece away for microscopic examination, which revealed, however, a simple inflammatory condition. The common duct was hard and strictured at the place of junction with the cystic duct. It was slit beyond the thickened area at both ends. It was probed into the duodenum, but no stone was found. A simple rubber catheter with an additional hole was inserted into the duct downward toward the duodenum. There was no suturing of the duct. Collapsible rubber drains were placed near the duct area and the abdomen closed. The patient was turned flat on his stomach for several days. The temperature which rose on the next day to 101.4 degrees came gradually down to normal in the course of a week.

Practically all bile came through the catheter. The itching had disappeared after forty-eight hours, and five days after the operation the jaundice had decidedly receded. On the morning of the sixth postoperative day, October 24, the discharge through the catheter had changed suddenly. The receiving bottle contained a water-colored, transparent but quite viscid secretion apparently containing mucin. When we first saw it, about four hours after the bottle had been emptied of normal-looking bile, 120 c.c. of this colorless fluid had gathered. This sight was, of course, for a moment perplexing as white bile would mean a serious damage to the liver. The dressings had just been changed by the nurse. We nevertheless wanted to inspect the wound, and to our great relief found the inner dressings soaked with golden yellow bile which escaped from the wound along side the catheter. There could be only one explanation. The clear and colorless fluid from the catheter was immediately tested for amylase, lipase and protease. Within perhaps ten minutes the starch was converted into sugar. In twenty-four hours the butter was decomposed into crystals of fatty acids with yellow oily globules floating on top, and hashed beef meat was dissolved. Thus we had a complete separation of pancreatic secretion from the bile. By evening of the same day 360 c.c. of the same limpid fluid without even a trace of bile color were discharged into the bottle in

about twelve hours while normal bile drained profusely into the dressings. The patient had eaten a very moderate amount of the general hospital diet for lunch, but had had a good breakfast. The catheter was then removed. Ten days after, there was some bile found in the stool. On November 2, fifteen days after the operation, the patient left the hospital in very good spirits with the fistula closed. He has felt well and works every day ever since according to his very recent report.

The observation that 360 c.c. of pure pancreatic secretion were collected in twelve hours, from 6 A.M. to 6 P.M. from a medium sized rather strong man, is of physiologic interest. Such opportunities for measuring are rare.* The obstruction to the flow of bile along the catheter was found to be due to a very marked swelling of the segment of the catheter which had been in the duct. On withdrawal of the tube, this portion was black and formed a club-shaped thickening, due perhaps to poor rubber (?).

The spurious "white bile" which we encountered in this patient was water-colored and could be called practically limpid. It was rather thickish on shaking, which is not ordinarily seen in white bile. It was quite different from the findings in the other cases.

Examination of the "White Bile"—Case 6

After preservation on ice for a number of days the fluid became a trifle opalescent and syrupy but at the time of operation it had been colorless and thin and was readily aspirated through a very fine needle.

Specific gravity—1007
Reaction—Faintly alkaline
Centrifuged sediment—About 10 red blood cells per field and an occasional white cell.
Albumen—Trace
Globulin—Trace
Urea nitrogen—11.76 mgms. per 100 c.c. of fluid
Urea—25.16 mgms. per 100 c.c. of fluid
Non-protein nitrogen—25.86 mgms. per 100 c.c. of fluid
Mucin—Trace
Bile acids—None
Bile pigment (Bilirubin)—None
Carbohydrates—Trace
Calcium—6.0 mgms. per 100 c.c. of fluid
Chlorides—0.813% (as sodium chloride)
Digestive ferments (diastase, lipase, protease)—None.

Archives of Internal Medicine, Vol. 61, p. 739, May, 1938. Report of case of complete pancreatic fistula in which the total external secretion amounted to 600 c.c. per day average. In the discussion Dr. W. T. Coughlin gives 400 c.c. per day as the average human secretion. In the same discussion Dr. Rolf Ium reports one patient with 200 c.c. per day, another with 500 c.c. per day, which he considers average secretion, and one patient with 1,400 c.c. per day, the largest amount of secretion yet recorded for any individual. All observers concur that the ingestion of food and liquid and the intramuscular or intravenous injection of secretin increase the rate of pancreatic external secretion.

Albumen and globulin traces can be explained by the admixture of a very small amount of blood from the puncture wounds.

N. C. Lake gives an analysis of the colorless fluid of his case as follows: Protein (albumen and globulin)—none; mucin—none; bile pigments—none; bile salts—none; cholesterol—none; chlorides (reckoned as NaCl) 0.862 per cent. Lake's chemical analysis of the "white" bile in his case is the only one I could find though others may have made similar studies. Reports of chemical analysis of simple hydrops of the gall bladder do not belong to our subject.

The picture of a colorless fluid in the bile channels with a completely white mucosa while all the surrounding tissues are deeply bile stained is really a perlexing sight. But we may well remember that saliva, tears, gastric and intestinal secretions, cerebro-spinal fluid are not stained either in icterus. Catarrhal sputum in a case of icterus is not bile stained while pneumonic sputum is. The first is a secretion while the last is an exudate with much blood and serum in it.

The difference between the septic "white bile" cases without obstruction and little or no icterus on the one hand and on the other the surgical cases with obstruction and deep jaundice is—be it repeated—a fundamental one. But a mechanical obstruction as mentioned before, may not always be very readily demonstrated. As a side remark let me mention that a simple spasm in the ductal system may lead to an icterus. This is demonstrated by what is called "icterus ex emotione." A sudden terrible fear may cause the appearance of jaundice within a few minutes, as for instance in a case of Umber's.[8] It can only be explained that the psychic shock brought on a severe spasm, probably not only in the larger but even in the small bile channels, with a sudden traumatizing blocking and evacuation of the already formed bile into the blood circulation. However, such a condition is too transitory to become a source of white bile.

Historically it is of interest that an excellent description and surgical discussion of our subject came already in 1912, from Lenormant under the title "L'hydropisie de la voie biliaire principale."[5] He reports a case of his own; the patient died of anuria after cholecystectomy and drainage of the hepatic duct. Carcinoma of the ampulla of Vater was the underlying condition. Lenormant

gives the literature up to that time with a careful analysis of the cases. He found thirty instances including his own. The article closes with the advice not to excise the gall badder in these cases so as to be able to use it for an anastomosis with the intestinal tract in case this should become necessary. Inasmuch as in those days white bile had been seen only in neoplastic obstruction, the suggestion was very apropos.

Summary

1. The white bile as seen by the pathologist in overwhelming sepsis rests on a fundamentally different cause from that seen by the surgeon in cases of obstruction of the bile ducts. The difference is that of acholia versus paracholia. These two conditions have not been kept sufficiently separate in the literature.

2. Infection is not the basic cause in the surgical white bile. The underlying condition is obstruction to the bile flow, though frequently infection is also present.

3. White or rather colorless bile is a secretion of the ducts with their glands. A water-colored secretion from bile-choked liver acini is not really thinkable. On the other hand a poorly-colored or even uncolored bile in overwhelming sepsis without noticeable obstruction is the result of a greatly disintegrated liver though even here some obstructive swelling in the smallest ducts is conceivable as coöperating.

4. The dextrose-galactose tests indicate that in cases of even severe icterus, experimentally provoked by ligation of the common duct, the liver function is not (at least for a long time) destroyed in this respect.

5. Normally colored bile may start flowing immediately after decompression followed by recovery—or may not appear until death.

6. If normal bile does not appear thirty-six or forty-eight hours after releasing of the obstruction, the prognosis becomes very grave though even after four days' delay recovery was observed.

7. One case is reported with chemical analysis of the fluid. In another case of (what looked like) white bile the condition was due to reflux of pancreatic secretion through a catheter in the common duct.

References

1. Aronson, H. G.: Pathogenesis of white bile. Arch. Surg., 32:1055, 1936.
2. Bernhard, F.: Experimentelle und klinische Untersuchungen über das Zustandekommen des Hydrops der Gallenwege oder der sogenannten weissen Galle. Arch. f. klin. Chir., 178:495-502, 1933.
3. Lake, N. C., and Patterson, J.: White bile with note. Lancet, 2:753-755, (Oct. 6) 1934.
4. LaManna: Die Pathogenese der weissen Galle. Virchows Arch. f. path. Anat., 298:447-463, 1936.
5. Lenormant: Revue de Chirurgie et de Gynecologie Abdominale. (Nov. 18) 1912.
6. McMaster, P. D., Broun, G. O., and Rous, P.: Studies on total bile. J. Exper. Med., 37:395, 1923.
7. Rous, P., and McMaster, P. D.: Physiological causes for varied character of stasis bile. J. Exper. Med., 34:75, (July) 1921.
8. Umber, F.: Erkrankungen der Leber, Gallenwege und des Pancreas. Handbuch d. innern Medizin, Bergmann, 3:35, 1926.
9. Walters, W., and Snell, A. M.: Diseases of the Gall Bladder and Bile Ducts. Philadelphia: W. B. Saunders, 1940.

ABNORMAL UTERINE BLEEDING IN ADOLESCENCE

NORA WINTHER, M.D.

Minneapolis, Minnesota

DORLAND'S medical dictionary defines adolescence as the period between puberty and maturity. We may include the ages from ten to twenty years in this developmental period. A careful study of the normal and abnormal uterine bleeding in these young women may aid materially in the better understanding of menstruation and its disorders.

The onset of catamenia in this country is expected between the ages of twelve and fourteen. However, the menarche starts between eleven and sixteen years in many normal girls. Race climate, social station and general health influence the menarche, with familial and individual variations. We might speak of premature menarche before the ninth year, delayed menarche after the eighteenth year. A year or more to establish a regular cycle is expected. A regular rhythm of menstruation from twenty-eight to thirty-day cycle with a flow lasting from four to five days is considered ideal. Obviously, such regularity is seldom encountered. A range of from twenty-one to thirty-five-day intervals with

Read at the annual meeting of the Minnesota State Medical Association, Minneapolis, May 18, 1943.

a flow varying from two to six days are frequent in apparently normal menstruation.

Incidence of Abnormal Adolescent Bleeding

Keene and Payne[13] found that of 500 patients admitted to the hospital for abnormal uterine bleeding only 4 per cent were under twenty years of age. Obviously, the fact that the majority of the cases of abnormal adolescent bleeding do not need hospitalization accounts for this low incidence. Of 7,634 women entering the University of Minnesota from 1938 to 1942, 22 per cent or 1,710 stated that their menstrual cycles were irregular. Of these 731 had had medical care during the high school period, and 225 complained of profuse bleeding. During these four years 2,302 students have consulted the gynecological department of the Student Health Service. It was found that very few women menstruate every twenty-eight to thirty days, most of the cycles occurring from three to five weeks. Vaginal discharge, dysmenorrhea, and irregular bleeding are the common complaints which bring the students in for a gynecological examination. There were 630 women (27 per cent) whose primary complaint was irregular bleeding.

Etiology

Before we consider the causes of abnormal uterine bleeding of the adolescent, we should consider the function of normal uterine bleeding, menstruation. The broad definition of menstruation advocated by Corner[4] and Hartman[12] include all of the factors associated with cyclic bleeding from the uterus. For clinical purposes, however, it is more satisfactory to limit the term menstruation, to "bleeding which occurs from an endometrium which has undergone the cycle of changes necessary for nidation," in accordance with the work of Schroeder[20] and Meyer.[16] Only such an endometrium can be considered normal, since the physiological purpose of the uterus is to prepare an endometrium suitable for the implantation and nourishment of the fertilized ovum. If menstruation is to be considered a normal phenomenon, then it must consist of changes in a normal structure.

The changes of the endometrium are controlled by a complex endocrine mechanism. Bleed-

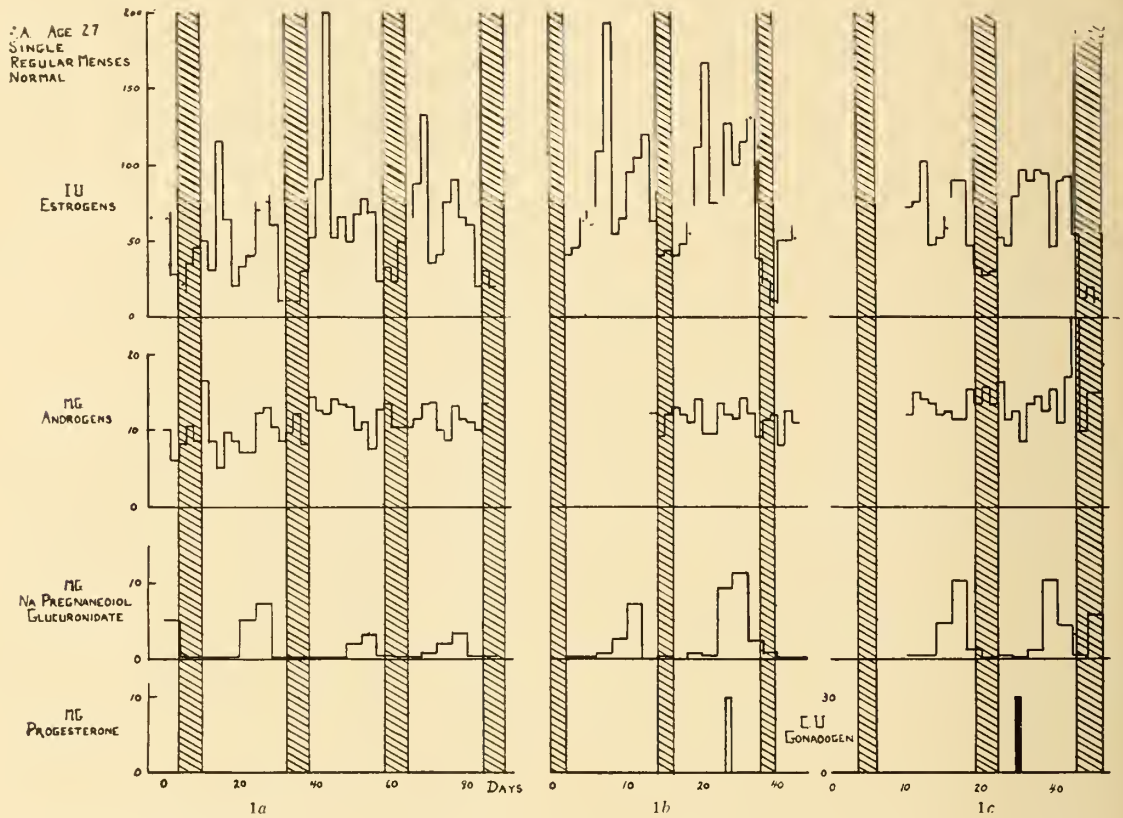


Fig. 1. Normal menstrual cycle. (*a*) Untreated; (*b*) progesterone injections; (*c*) mare's serum injections. Shaded areas indicate menstruation.

ing from an endometrium similar to that seen in normal menstruation can be produced in castrate monkeys and ovariectomized women if the subject is treated with estrogens, followed by progesterone. Bleeding follows in twenty-four to seventy-two hours after the progesterone is discontinued, which is the interval observed in normal menstrual cycles after the disappearance of pregnanediol in the urine (Fig. 1). Gillman[9] has shown that there is an optimal estrogen-progesterone ratio for the normal cycle in women. An ovarian deficiency is the probable cause of abnormal bleeding in the adolescent. This may be primary, or secondary to another endocrine gland, probably the pituitary or thyroid, or to some constitutional disorder. In the primary type, the immature ovary fails to respond to the pituitary stimulation, consequently rupture of the follicle and luteinization may not occur. Three important factors in uterine bleeding are the hormonal effect of the pituitary gland, the response of the ovary, and the response of the uterus to both the pituitary and ovarian stimulation.

Classification of Uterine Bleeding

The literature on abnormal bleeding is confusing because of the discrepancy of terms used. Uterine bleeding may be divided into two main categories: disturbances of menstruation and nonmenstrual bleeding. Uterine bleeding will persist until healing by epithelization occurs. The amount of bleeding depends upon the size of the vessels involved and the resistance to closure by natural or mechanical means.

The Schroeder classification has been used as a basis to sort out the various types of bleeding. As more information is available from hormone studies and endometrial biopsies, the subdivisions of the following classification become apparent:

A. Disturbances of Menstruation.

I. *Disturbances in the regularity of the cycle.*

a. Shortened cycle (polymenorrhea).
   1. Premature interruption of the cycle.

b. Lengthened cycle (oligomenorrhea).
   1. Persistent corpus luteum.
   2. Hyperplasia of the endometrium.
   3. Inhibited cycle followed by a normal cycle.

c. Amenorrhea.
   1. Physiological.
   2. Primary amenorrhea.
   3. Secondary amenorrhea.

d. Acyclic bleeding (metrorrhagia).

II. *Disturbances in the amount of menstrual flow.*

a. Profuse flow (hypermenorrhea).
   1. Hypoplastic uterus.
   2. Hypothyroidism.
   3. Tumors (polyps, submucous myomata).
   4. Pelvic congestion.
   5. Endometrial hyperplasia.

b. Scanty flow (hypomenorrhea).
   1. Hypogonadism.
   2. Hyperthyroidism.

III. *Disturbances in the duration of menstrual flow.*

a. Lengthened bleeding period (menorrhagia).
   1. Irregular shedding and irregular ripening.
   2. Endometrial hyperplasia.
   3. Inflammatory.
   4. Tumors (benign or malignant).

b. Shortened bleeding period.
   1. Hypogonadism.

B. Nonmenstrual Bleeding.

I. *Disturbances under ovarian control.*

a Cystic glandular hyperplasia.
   1. Granulosa cell tumors.

b. Ovulation bleeding.

c. Anovulatory bleeding.

d. Following hormone treatment.

II. *Disturbances not under ovarian control.*

1. Uterine, acyclic bleeding (metrorrhagia).
   a. Tumors (polyps, myomata).
   b. Incomplete abortion.
   c. Infection.
   d. Malignancy.

2. Adnexal.
   a. Tumors.
   b. Pelvic inflammatory disease.

3. Blood dyscrasias.
   a. Purpura hemorrhagia.
   b. Leukemia.
   c. Aplastic anemia.

4. Constitutional diseases.
   a. Congenital lues.
   b. Tuberculosis.
   c. Cardiac decompensation.
   d. Grave's disease.
   e. Nervous disorders (shocks, fright).

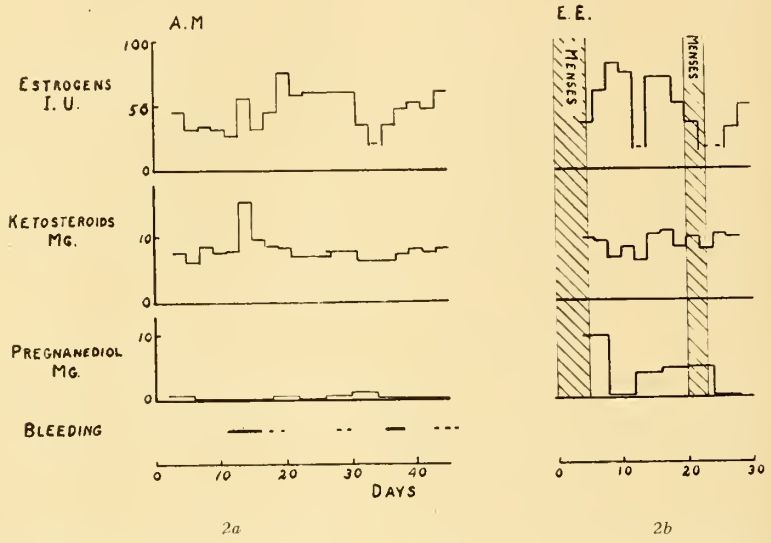
Diagnosis and Pathology

A careful physical examination should be done including a rectal examination, blood studies (including bleeding time and platelet count and Wassermann test) and basal metabolism rate and at times an endometrial biopsy. We may divide the abnormal bleeding into two groups: (1) disturbances of the endocrine glands and (2) bleeding associated with constitutional diseases.

Disturbances of the Endocrine Glands

(a) *Pituitary Dysfunction.*—Many believe that hyperfunction of the pituitary is largely responsible for the menstrual irregularity. Fluhmann[8] described "Pubertas præcox," uterine bleeding before the age of nine, and assumed it to be due

to a hyperfunction of the anterior pituitary where no other pathology could be found. Pituitary dysfunction is also suspected in the obese girl with a normal basal metabolism. The pituitary tion of the pituitary with failure of progestin formation, and resulting in a hyperplasia of the endometrium. In hormone studies the estrin output is maintained at a high level (Fig. 2*a*).



2a *2b*

Fig. 2. (*a*) Hormone determinations in the urine in a case of hyperplastic endometrium with severe bleeding. Note the maintenance of a high estrin level. (*b*) Hormone determinations in the urine in a case of irregular shedding of the endometrium. Notice the continuance of pregnanediol secretion throughout the menses.

type is more difficult to recognize in the adolescent than in the adult where all the characteristics of dyspituitarism are evident.

(b) *Hypogonadism.* — The underdeveloped ovary fails to respond to pituitary stimulation. Physical examination reveals an undernourished, tall, hyposthenic girl with underdeveloped secondary sex characters, such as scanty pubic hair, hypoplastic genital organs and underdeveloped breasts.

(c) *Hypothyroidism.*—The characteristics of hypothyroidism may be present, such as obesity, dry skin, fatigue, sometimes mental dullness, and an increased serum cholesterol concentration. However, a normal-appearing girl with a basal metabolism rate slightly below normal is frequently encountered with profuse uterine bleeding.

Pathology of the Endocrine Group.—Cystic glandular hyperplasia is found in adolescence as well as in the menopause. Perhaps for sentimental fear of rupturing the hymen, a diagnostic curettage is seldom done in puberty; however, a severe hemorrhage or prolonged flow during the adolescent period may necessitate it. Cystic glandular hyperplasia is probably due to a dysfunc- Frequently, the amount of bleeding is not in proportion to the degree of hyperplasia of the endometrium. Gillman has shown the existence of estrogen-sensitive and estrogen-resistant women. The pathology is the same as that found in the adult. The ovaries show many follicles in various stages of growth and atresia with no evidence of recent ovulation or corpus luteum formation.

Irregular Shedding and Irregular Ripening.—Traut and Kuder[22] have shown that whereas hyperplasia represents the Graafian follicle phase, irregular shedding represents the corpus luteum phase. They also describe "irregular ripening," in which the endometrium shows both proliferative and secretory phases. The menstrual flow may persist for eight to twenty-one days. The normal tempo of the onset of the flow is maintained but regeneration of the endometrium is prolonged. To be sure of a diagnosis, a curettage should be done between the eighth and the tenth days of the bleeding. The transition between the functioning stage, proliferation and regeneration will be found in the endometrium indicating a delay in healing. However, in the menarche, the condition is frequently self-limited and curettage

is not necessary. Hormone assays in irregular shedding indicates the excretion of progesterone continuing during the bleeding phase (Fig. 2*b*).

Anovulatory Bleeding.—The discovery of anovulatory bleeding in monkeys indicates that estrin alone might account for menstruation. Markee[14] transplanted small pieces of endometrium in the anterior chamber of the eye in monkeys. He found no difference in the process of menstruation whether ovulation took place or not. He concluded that the actual cause of the uterine bleeding was due to the regression of the endometrium. An increased fragility of the capillaries followed the marked coiling of the spiral vessels. A disproportion between the length of these vessels and the thickness of the endometrium indicated that menstrual flow occurred whenever a regression of the uterine mucosa took place. According to Markee, progestational stimulation of the endometrium was not necessary for menstruation.

On the other hand, Daron[5] found the endometrium to differ in anovulatory bleeding from that of normal menstruation. In the former, the coiled arteries were not at the surface and the terminal arterioles were intact, whereas, in the ovulatory menstruation the surface arteries were completely occluded. Robert Meyer[17] has shown that anovulatory bleeding differs in essential details from menstruation, and indicates an interruption of the menstrual cycle. The regression of the follicle while the endometrium is proliferating is the essential feature of anovulatory bleeding according to Meyer. That anovulatory bleeding is not the general rule in the menarche has been shown by the number of pregnancies reported in countries where child marriages are common. In any case, premature interruption of the cycle is frequent in the adolescent period.

Endometrial biopsies may aid in the diagnosis of abnormal bleeding if it is possible to interpret the endometrial changes in terms of endocrine function. Vaginal smears are simple office procedure but again the interpretation is difficult. In recent years, hormone assays of the blood[7] and urine[24] have also thrown light on the endocrine background in menstrual disorders. Unfortunately, hormone assays are not available to the majority of clinicians as yet, because of the expense and time consumed in running the assays. A single assay is of very little value.

BLEEDING ASSOCIATED WITH CONSTITUTIONAL DISORDERS

(a) Granulosa cell tumor of the ovary should be ruled out by vaginal or rectal examination. Early development of secondary sex characters and menstruation may be due to an excess of estrogen from the ovarian tumors.

(b) In hydrocephalus, tumors of the hypothalamus, and in inflammatory conditions such as encephalitis and meningitis prepubertal bleeding has been reported.[8]

(c) Blood dyscrasias.—Buxton[2] reported seven cases out of 108 of Purpura hemorrhagica where the chief complaint was profuse uterine bleeding, two cases with aplastic anemia and one of acute lymphatic leukemia.

(d) Congenital lues.
(e) Tuberculosis.
(f) Grave's disease.
(g) Cardiac decompensation.
(h) Pelvic inflammatory disease.
(i) Malposition of the uterus.
(j) Teratoma and sarcoma.
(k) Polyps.
(l) Nervous disorders, shocks and fright.

Treatment

A careful examination to determine the cause of the abnormal bleeding should be the first step in the treatment. Until we better understand the endocrine function in respect to the pituitary stimulation and the response of the ovary and uterus, we will continue to treat abnormal bleeding empirically. In the adolescent, particularly, abnormal bleeding is frequently self-limited and is best left untreated. The hormones act as regulators or intermediates in the complicated chemistry of the body. Hormone therapy should be used cautiously unless adequate control studies are made.

Dessicated thyroid extract is indicated when the serum cholesterol concentration is increased or the basal metabolic rate is decreased. Clinically, excellent results have been obtained in profuse menstrual bleeding with small doses of thyroid. Cooke[3] advises thyroid for a period of six months. Plass[18] has also called attention to the use of thyroid when the basal metabolism rate is between zero and minus 10 per cent. Careful observation is necessary because of the variability in the tolerance of the drug. The appearance of palpitation, headache and nervousness in-

dicate an overdose. Small amounts of Lugol's solution occasionally regulates prolonged menstrual bleeding.

The use of estrogens to stop excessive uterine bleeding has been advocated by Hamblen.[11] The ability of estrogens to tone up the uterine musculature and the blood vessels may account for the good results obtained. An endometrial biopsy or hormone assays should precede its use. It is indicated in bleeding from an estrogenic endometrium, atrophic endometrium with a hypoplastic uterus, or when excessive progestational reaction exists. Estrogens should not be given in large doses over a long period of time in the adolescent because they do not stimulate the growth of the ovaries but actually inhibit the pituitary and thus reduce the ovarian function as was brought out by Sevringhaus.[21]

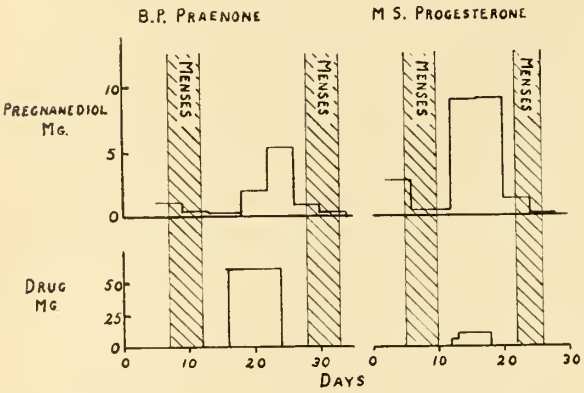


Fig. 3. B.P. received 60 mg. pranone per day orally for eight days, beginning four days after menstruation ceased. M.S. received 5 mg. progesterone on the third day after menstruation ceased, increased to 10 mg. on the fourth day and continued for five days.

Progesterone also has been used in the treatment of abnormal uterine bleeding. Weisbader[23] reported twenty cases of juvenile uterine bleeding treated with oral pregneninolone, the effective dose ranging between 280 and 350 mg. given in divided doses of 50 mg. daily. Three patients who did not respond to the oral therapy were given 25 to 50 I. U. of corpus luteum hormone by injection with good results. Paradoxically, the administration of progesterone is followed by bleeding in the normal subject. If progesterone is administered to a normal woman during the first half of her menstrual cycle, bleeding will occur from a secretory endometrium within the usual interval after the hormone treatment is stopped, according to Gillman and others. Two cases in our hormone study were given progesterone in the first half of the cycle, one receiving 10 milligrams daily by injection and the other was given a daily dose of 60 milligrams of pregneninolone (pranone). Both of these started the uterine bleeding from forty-eight to seventy-two hours after the hormone was discontinued (Fig. 3).

Chorionic gonadotropin has given good results in a small series of cases of profuse uterine bleeding in the adolescent. The dosage is difficult to calculate since we cannot measure the normal output nor the deficiencies present. Gonadotropins should not be given over long periods of time because of the possibility of producing refractive or polycystic ovaries. However, with signs of hypogonadism, a therapeutic test of gonadotropins is advisable. Mazer and Israel[15] gave ten consecutive injections of 30 Cartland-Nelson units on alternate days with good results in his four cases of juvenile bleeding.

Sixty-four cases of profuse menstrual bleeding were treated at the University Health Service from 1938 to 1942. Eleven of these were curetted and two were given blood transfusions because of continued profuse bleeding. Forty-six of these were given chorionic gonadotropin (Antuitrin S or A.P.L.) the usual dose being 500 I.U. daily for four doses starting the fifth day of the flow when possible or directly following curettage. Thirty-eight responded favorably, most of them receiving 200 I.U. doses after subsequent menstrual periods. Before 1939, most of the women with profuse or prolonged flow were given Lipo soluble ovarian substance (Sistomensin) during the first three days of the bleeding cycle, with about fifty per cent being benefited.

Equine gonadotropin (gonadogen) was given to seventeen of the college women with improvement in 40 per cent of the cases of prolonged or profuse menstruation. Gonadotropic hormone from pregnant mare's serum given to normal women in the first part of the menstrual cycle increased the output of estrogens in the urine, but did not affect the pregnanediol levels in our series. In one case in which a single peak of estrogen had been present, 30 Cartland-Nelson units of gonadogen were given intramuscularly on four successive days and intravenously on the fifth day. Urine assays revealed a double

estrogen peak after the administration of this hormone.

Rydberg and Pedersen-Bjergaard[19] treated secondary amenorrhea with 3,000 I.U. of equine gonadotropin daily for five consecutive days followed by 1500 I.U. of chorionic gonadotropin on alternate days for three doses. Menstruation occurred about ten days after the last injection. About one-half of the patients treated continued to menstruate regularly after the therapy was discontinued. Many of those treated were confined to bed for a few days because of pain. Enlargement of one or both ovaries was noted in these cases. A laparotomy was performed on one of these women and lutein tumors were found.

Testosterone propionate has been given for profuse bleeding with good reports. One should be especially cautious in its use in women under twenty years of age. It is better not to give testosterone unless one understands its limitations and dangers.

Combined treatment with estrogens and progesterone have been used successfully in amenorrhea and profuse bleeding. In the latter, control of the bleeding must be accomplished first. Injections of 10,000 I.U. of estrogen is given for fourteen consecutive days followed by 5,000 I.U. of estrogen given concurrently with 5 mg. progesterone for the next seven days. No injections are given for seven days after the onset of the bleeding. Then a second course is given. Equally good results have been obtained by the use of diethyl stilbestrol tablets 0.5 mg. twice daily for two weeks followed by 0.5 milligrams daily given concurrently with 10 milligrams pregneninolone daily the third week in twenty cases treated in 1942 at the University Health Service. Those treated during this past year are not included because they have not been followed for a long enough period of time.

The immediate control of severe bleeding may be the real problem to the clinician. Rest in bed and oxytocics may control the hemorrhage. Posterior pituitary extract or ergonovine may be used as a temporary control of the bleeding. A curettage should be performed if the bleeding continues, with packing of the uterus and vagina if necessary. Blood transfusions should be given in cases of severe anemia. Good results have been reported from using pregnant donors giving the patient both blood replacement and possibly the benefit from the gonadotropic hormone contained in the blood. Lactating women have also been used, giving 15 to 40 c.c. of their blood intramuscularly (Greenblatt and Torpin[10]).

Moccasin snake venom has also been reported to have given good results. In the two cases in which it was used by the author it did not affect the bleeding. Vitamin K may be given although its use is empirical.

General health measures are important in preventing recurrences of abnormal bleeding. A well-balanced diet should be prescribed including sufficient vitamins, liver and iron. Insulin therapy in the undernourished should not be overlooked. Mental and physical rest is also important in this developmental period. Psychotherapy may account for many of the symptomatic results from various treatments. The change in amount and duration of bleeding and regulation of the cycles were frequently noted in a group of college women treated with placebo in a controlled study of dysmenorrhea by the author.[1]

Low-dosage irradiation of the pituitary or ovary must be used with great caution in the adolescent. Drips[6] reported good results in a small number of patients. Irradiation may be a method of choice in intractable cases. Intrauterine radium must also be used with great caution. Keene and Payne state that the initial dose should not exceed 200 milligram-hours in women under twenty years of age, with an additional 100 mg. if further treatment is necessary. Hysterectomy may be considered in preference to irradiation or radium in intractable cases.

In nonmenstrual bleeding not under ovarian control the underlying pathology determines the specific therapy.

Conclusions

1. Of 7,634 women entering the University of Minnesota from 1938 to 1942, 22 per cent complained of irregular menstruation, 225 of these complaining of profuse bleeding.

2. During these four years 2,302 students have consulted the gynecological department of the Student Health Service, 630 of whom came because of irregular bleeding.

3. A modified Schroeder classification has been used in our study of uterine bleeding.

4. Hormone assays have been done on the urine in normal cases, and on patients with irregular shedding, anovulatory bleeding, cystic glandular hyperplasia, and oligomenorrhea.

5. The effects of the administration of the various hormones on the excretion products in the urine have been studied.

6. Hormones should be administered to patients with abnormal bleeding in the adolescent with caution and not until a careful physical examination including laboratory tests have been made to determine the cause of the bleeding.

7. The author's experience in treating abnormal bleeding in young college women is briefly reviewed.

8. Abnormal bleeding is frequently self-limited and results due to spontaneous remissions or other fortuitous factors must be kept in mind before one judges the efficacy of any therapy.

9. Physicians should not become impatient with the slow progress made in the study of the hormones.

10. Continued clinical application of the increasing knowledge of endocrine function will aid in the treatment of abnormal uterine bleeding.

Bibliography

1. Boynton, R. E., and Winther, N.: The treatment of primary dysmenorrhea with estriol glycuronide. J.A.M.A. 119:122, 1941.
2. Buxton, C. L.: Menorrhagia as a primary factor in various blood dyscrasia. Am. J. Obst. & Gynec., 42:502, 1941.
3. Cooke, W. R.: Essentials of Gynecology, p. 685. Philadelphia: Lippincott, 1943.
4. Corner, G. W.: Oestrus, ovulation and menstruation. Physiol. Rev., 3:457, 1923.
5. Daron, G. H.: Arteriol pattern of the tunica mucosa of the uterus in Macacus rhesus. Am. J. Anatomy, 58:349, 1936.
6. Drips, D. G., and Ford, F. A.: Clinical and experimental studies of low dosage irradiation of hypophysis in menstrual disorders. Radiology, 12:393, 1929.
7. Fluhmann, C. F.: Estrogenic substances in blood of women. Am. J. Obst. & Gynec., 32:612 (Oct.) 1936.
8. Fluhmann, C. F.: Menstrual Disorders, p. 47. Philadelphia: Saunders, 1939.
9. Gillman, J.: Effect of single injections of estradiol benzoate on normal human menstrual cycle. J. Clin. Endocrinol. 2: 146, 1942.
10. Greenblatt, R. B., and Torpin, R.: Meno-metrorrhagia; new method of treatment. J.M.A. Georgia, 28:342, 1939.
11. Hamblen, E. C.: Functional irregularities of uterine bleeding. Endocrine Gynecology, p. 342. Springfield, Ill.: Thomas, 1939.
12. Hartman, C. G.: Sex and Internal Secretions. Baltimore: Williams and Wilkins, 1932.
13. Keene, F. E., and Payne, F. L.: Results of radium treatment in functional uterine bleeding. Surg., Gynec., & Obst., 56:322, 1933.
14. Markee, J. E.: Menstruation in ocular endometrial transplants (abstract), Anat. Record, 55:66, 1933.
15. Mazer, C., and Israel, S. L.: Menstrual Disorders and Sterility. Diagnosis and Treatment of, pp. 272-289. New York: Hoeber, 1941.
16. Meyer, R.: Ueber corpus luteum-Bildung beim Menschen. Arch. f. Gynäk., 93:354, 1941.
17. Meyer, Robert: Verbal communication.
18. Plass, E. D.: Observations on functional menstrual disturbances of adolescents. Am. J. Obst. & Gynec., 21:205, 1931.
19. Rydberg, E., and Pedersen-Bjergaard, K.: Effect of gonadotropins on ovary. J.A.M.A., 121:14, 1943.
20. Schroeder, R.: Der Ovulationstermin. Zentralbl. f. Gynäk., 42:633, 1918.
21. Sevringhaus, E. L.: Menstrual abnormalities of adolescence. J. Pediat., 19:319, 1941.
22. Traut, H. F., and Kuder, A.: Irregular shedding and irregular ripening. Surg. Gynec. & Obst., 61:145, 1935.
23. Weisbader, H.: Oral therapy with pregneninolone in functional uterine bleeding. Am. J. Obst. and Gynec., 42: 1014, 1941.
24. Winther, Nora: The endocrine factors in menstruation and its relation to dysmenorrhea. J. Lancet, 62:428, 1942.

HEMORRHAGE IN PREGNANCY

F. J. SCHATZ, M.D.

Saint Cloud, Minnesota

STATISTICS on maternal mortality still show a high percentage of deaths due to hemorrhage, and it has been emphasized that in this State,[18] the decrease in the number of maternal deaths due to sepsis and toxemia has not been paralleled by a similar decrease in deaths due to hemorrhage. In the country as a whole, there has been a marked decrease in the number of maternal deaths due to hemorrhage since the more general availablility of blood transfusion owing to establishment of blood banks and the discovery of new blood substitutes as well as the use of ergonovine in the third stage of labor. Attention has been drawn, however, to the fact that many deaths listed as due to hemorrhage are in reality due to shock[41] and that the reduced mortality rate mentioned above concerns cases of hemorrhage per se. It has also been indicated that in spite of the greater facilities for blood replacement, these are not always promptly utilized. Precious time is frequently lost owing to lack of precision in diagnosis or to confusion because of lack of standardization of techniques of treatment. By routine recording of the specific gravity of the blood shortly before delivery and of the amount of blood lost in each case, with the use of soft tissue roentgenograms and the records of the results of various therapeutic procedures in given types of hemorrhage, it should be possible to achieve more accurate diagnosis, an earlier evalution of new methods of treatment and their more rapid and general application.

Read at the annual meeting of the Minnesota State Medical Association, Minneapolis, May 18, 1943.

A study of the records from the maternal department of the St. Cloud Hospital of St. Cloud, Minnesota, over a period of twenty years, shows that in 1922 there were 172 deliveries and in 1942, 925 deliveries. During the twenty-year period, there were 8,321 deliveries, with thirty-five maternal deaths from all causes, of which eleven were due to hemorrhage (two cases of shock, four cases of placenta previa, four cases of postpartum hemorrhage and one case of uterine rupture). The amount of blood loss in a series of 407 deliveries at this hospital is shown in Table I.

TABLE I. BLOOD LOST POSTPARTUM

Age	60 to 200 c.c.	200 to 400 c.c.	400 to 600 c.c.	600 to 800 c.c.	800 to 1000 c.c.	1000 to 1200 c.c.	1200 to 1400 c.c.	1400 to 1600 c.c.	1600 to 1800 c.c.	1800 to 2000 c.c.	2000 to 2100 c.c.
Grav. I											
16—25	24	28	10	6	0	0	0	1	0	1	0
25—30	9	19	7	3	2	1	0	1	0	0	0
30—35	15	13	4	3	1	1	0	0	0	0	0
35—40	5	2	2	2	0	0	0	0	0	0	0
40—46	2	2	0	0	1	0	0	0	0	0	0
Total	55	64	23	14	4	2	0	2	0	1	0
Multi-grav.											
16—25	8	10	4	2	2	1	0	0	1	0	0
25—30	32	35	7	5	4	3	0	3	0	0	0
30—35	33	23	10	3	0	0	0	0	1	0	1
35—40	14	10	5	2	0	2	0	2	0	0	0
40—46	7	5	3	2	0	0	1	0	1	0	0
Total	94	83	29	14	6	6	1	5	3	0	1

The causes of excessive postpartum bleeding are: (1) low placental implantation; (2) uterine inertia; (3) relaxation of uterus due to too deep surgical anesthetic in repairing episiotomies; (4) too hasty removal of the placenta.

None of the above patients who lost more than 600 c.c. of blood had any ill effects. Each recovered within ten days and was able to leave the hospital.

The causes of hemorrhage are different in the three trimesters of pregnancy. When bleeding occurs during the first trimester, the most common cause is abortion or ectopic pregnancy. Other conditions which may cause hemorrhage during early pregnancy include retroversion, multiple pregnancy, syphilis, toxemia, subacute salpingitis, decidual endometritis, uterine myomas and pulmonary tuberculosis. Also deep cervical tears,[15] hydatidiform mole,[9] congenital malformations of the uterus, cervical erosions, varicas,[22] or carcinoma and vaginal, labial or extragenital lesions may be responsible.

Various methods have contributed to greater accuracy in the diagnosis of these conditions, such as observance of the time of onset of bleeding, the degree of hemorrhage, the condition of the blood and the presence or absence and type of pain. Decidual biopsy[38] has been recommended by some writers as a means of ascertaining whether abortion is inevitable. Also the Achheim-Zondek test for hydatidiform mole[9] and the roentgen ray diagnosis of tubal pregnancy, placental insertion and detection of monster feti have proved valuable.

In differentiating between abortion and ectopic pregnancy,[37] it is emphasized that the former usually occurs between the eighth to twelfth week and the latter from the fourth to sixth week. The bleeding in the former is usually profuse and bright red in color, and the pains rhythmical, whereas in the latter, hemorrhage is less abundant, the blood is darker containing decidual rests, and the pain sharper. Ectopic pregnancy has to be differentiated from acute appendicitis, acute adnexitis, follicular rupture, ruptured corpus luteum, ruptured pyosalpinx, cystadenoma of the ovary with twisted pedicle, hemorrhagic pancreatitis, and perforation of the bladder.

Abortion is the most common cause of hemorrhage in early pregnancy, and may be induced or spontaneous, threatened, habitual, or inevitable. The abortion may be complete or incomplete, or missed with retention of the fetus. Each of these conditions has its own special indications for therapy. Prophylactic measures in cases of threatened and habitual abortion include administration of vitamin E[42] and C,[27] progesterone, thyroid and opiates. Opinions vary as to the use of morphine, as the resulting relaxation of the cervix and stimulation may transform a threatened abortion into inevitable abortion. Oral prenone has been recommended in doses of 10 mg. twice daily until symptoms subside, and then twice weekly for several months. If this fails,

digital exploration of the uterus and evacuation of its contents may be necessary.

In cases of illegal abortion associated with bleeding, any placental tissue in sight may be removed with sponge forceps. Curettage is not a safe procedure in the presence of frank sepsis. In fact, it is nearly always fatal. Oxytocics to stimulate uterine contractions, may control bleeding. Locally nothing should be done, besides an ice bag to the lower abdomen until the septic condition improves. The alcohol drain in these cases, as suggested many years ago by Dr. E. J. Ill, is most valuable.

In cases of incomplete abortion with hemorrhage, the aim of treatment is to aid in delivery of the fetal products from the uterus. This may be achieved by administration of pituitrin, ergot or both intramuscularly with careful attention to immediate availability of emergency measures to combat hemorrhage.

In complete abortion the bleeding as a rule subsides once the fetal products have been passed and involution can be accelerated by administration of oxytocics.

In inevitable abortion the symptoms differ only in degree from those of threatened abortion. The hemorrhage and pains are more severe and the bleeding may become profuse before the membranes are expelled. If the hemorrhage is profuse, emptying of the uterus is indicated. Expulsion may be hastened by administration of pituitrin or ergot. If bleeding is not excessive one may proceed expectantly awaiting expulsion.

In missed abortion, the fetus dies in utero and the membranes are retained with atrophic changes. The fetus may be retained for months and is eventually expelled in its dried state. Before expulsion, intermittent bleeding occurs and may last for several weeks. This is followed by profuse bleeding, pain and expulsion. Some authorities prefer to await expulsion, others administer estrogen[19] to expedite matters.

It has been estimated that 98 per cent of ectopic pregnancies occur in the tubes. If the fertilized ovum happens to be near the outer end of the tube, the developing embryo will cause enlargement of the lumen of the tube, with extrusion of the embryo and membranes into the peritoneal cavity, which is accompanied with more or less bleeding. Hemorrhage may be moderate and repeated or profuse, leading to severe shock. Rupture of extrauterine pregnancy in the isthmial portion of the tube is manifested by sudden, excruciating pain, vomiting, blanching, rapid weak pulse and collapse (one such case was seen in the writer's office). The treatment is laparotomy, but only after shock has been cared for. Simultaneous blood transfusion during operation, or reinfusion of the patient's own blood, has yielded good results in many cases.

Extrauterine pregnancy within the uterine wall may break into the uterine cavity, with profuse vaginal bleeding and go on to term due to sufficient placental attachment to the uterine wall. The only symptom is the bleeding which occurs at the time of expulsion. One case so diagnosed prior to an estimated blood loss of 500 c.c. went on to term.

In multiple pregnancy, hemorrhage occurs when the placental attachment is low, marginal, or over any portion of the internal os. The bleeding may be slight or profuse and with or without pain.

In retroflexion, the only symptom may be mild or even profuse bleeding over a period of several days (up to eighteen days). After replacement of the uterus, the bleeding may stop within forty-eight to seventy-two hours without interruption of pregnancy.

Bleeding during the second trimester is infrequent, and when it occurs, may be due to the same causes as in the first trimester, to hydatidiform mole or placenta circumvallata. In hydatidiform mole,[9] the bleeding may last for several weeks. The bleeding is intermittent and the uterus enlarges symmetrically, followed later by spontaneous expulsion of the mole.

In circumvallate placenta, the only symptom is the loss of blood which may last for several weeks before labor is established.

Bleeding is infrequent during the third trimester of pregnancy,[43,46,48] and when it occurs, may be due to extragenital or genital lesions. Among the former may be mentioned circulatory disturbances, nephritis, and the blood dyscrasias.[12,40] The genital lesions include extrauterine pathology such as tears,[15] hematoma,[45] necrosis and varicosities.[22] The intrauterine conditions are placenta previa, premature separation of a normally implanted placenta and tumors.

In cases of bleeding in the third trimester, no time should be lost in getting the patient to the

hospital with a vaginal pack before transportation only in extreme cases. No vaginal examination should be made before the patient arrives at the hospital and then only when full preparations for transfusion, delivery or operation are in order. Even gentle manipulation of the placenta may precipitate hemorrhage. Soft tissue roentgen examination may aid in ruling out placenta previa. A sterile vaginal examination and roentgenography may spare the patient needless termination of pregnancy.

Cystography will aid in differentiating between cases of partial and total placenta previa. The absence of pain should rouse suspicion of placenta previa, but Wallace[46] has recently emphasized the fact that pain is present in a large number of these cases. If placenta previa becomes evident during the second stage of labor, conservative expectant treatment is justifiable. Treatment for shock should always be administered before delivering the patient. The decision as to whether vaginal or abdominal delivery shall be employed will depend upon the degree of hemorrhage, the type of placental insertion, viability of the fetus, degree of cervical dilatation, the time of onset and the parity of the patient.

Surgical treatment is said to give best results in primiparae. In multiparae simple rupture of the membranes is the treatment of choice. In a recent series of 2,000 cases analyzed by Ramirez Olivella,[29] with an incidence of one in every 250 deliveries, classical cesarean section was found to give the poorest results. The fetal mortality rate was in inverse proportion to the age of gestation, and in direct proportion to the site of insertion, i.e., the lower the insertion the higher the mortality. Most of the maternal deaths were due to hemorrhage or infection.

Davis,[13,14] of Nebraska, obtained best results by simple rupture of the membranes and second best by use of Willets scalp traction. Cesarean section offers best prospects for a living child. Pre-operative roentgen examination may be of aid in determining the type of section. Davis found results of Braxton Hicks' version, uterine pack, vaginal cesarean section and manual dilatation of the cervix to be poor.

It is well to keep in mind that the more central the location of the placenta, the earlier does bleeding take place. Spontaneous separation of the placenta with or without external bleeding causes early pain which subsides if the blood escapes from the uterus. In concealed hemorrhage, the pain is constant and severe, with board-like hardness of the abdomen, absence of fetal heart sounds in complete separation or in the presence of a hematoma under the placenta. Roentgen examination may reveal an outline in a low implanted placenta.

Intrapartum Hemorrhage

Intrapartum hemorrhage is most often caused by partial or complete spontaneous separation of either a normally implanted placenta, placental attachment to the upper portion of the lower uterine segment or from rupture of a vessel in a velementous attachment of the cord. This type of hemorrhage is usually concealed until the head slips out of the cervix or after the delivery of the body. The low attached placenta causes the greatest amount of bleeding and is very difficult to deliver, as it does not readily separate due to failure of good contraction and retraction of the lower uterine segment. The bleeding is profuse and cannot be controlled by grasping the uterus, giving ergot, pituitrin or both early, until there is complete separation of the placenta. My practice is to give pituitrin (0.13 to 0.19) shortly before the delivery of the head and ergotrate 0.0003 immediately after the head is delivered. This, too, has failed to give the desired results in many cases. No difficulty has ever been encountered in delivering the placenta due to medication.

In premature separation of the placenta, Olivella[29] found an incidence of 0.14 per cent. This condition occurs most frequently in multipara and exclusively in the last three months of pregnancy. It is toxic in origin with increase in uterine tonus, painful hemorrhage, albuminuria and cylindruria. Amputation of the uterus is unnecessary. Conservative treatment is recommended.

In an analysis of ninety cases, Boulware[5] states that multiparity adversely affects prognosis, while fetus prognosis is unfavorable regardless of the severity of the disease or the type of therapy. The most important phase of treatment is blood replacement. Manual dilatation of the cervix should be avoided. Mild cases may receive expectant treatment. Repeated transfusions may be required. If the prospects for normal delivery seem poor, cesarean section must be done. It

is important to treat shock by blood replacement before delivery.

At the Chicago Lying-In Hospital, these cases are given intravenous hypertonic glucose and antishock treatment. Simple rupture of the membranes or simple low forceps are indicated. Cesarean section and accouchement forcé should be avoided if possible. If the patient is in labor she should be delivered vaginally; if not, by cesarean section, but with transfusion during operation. Whereas there has been a clear trend for experts to limit the use of cesarean section in the treatment of premature separation of the placenta, Miller[26] claims that this operation should be extended to all cases in which ideal conditions obtain. He states that with a proper selection of cases, there is no increase in mortality, no serious limitation to childbirth, and the fetal mortality is lower. Also Rauramo[35] reports better results with active treatment.

If the condition should prove to be a genuine uteroplacental apoplexy in which the uterus no longer responds with contraction to pituitrin, hysterectomy is indicated. It has been emphasized that in these cases removal of the uterus does not remove the underlying pathology which is believed to be a toxemia. The apoplexy may extend to organs other than the uterus.

Most cases of retroplacental hemorrhage will respond to obstetrical medical treatment. Observation during the postpartum period is of great importance. If hemorrhage persists laparotomy is indicated.

Rupture of the uterus occurs more frequently than supposed.[1,6,33,47] It may be due to scars from previous cesarean sections, from curettage, myomectomy, plastic operations on the uterus, manual removal of the placenta, fibroids, congenital malformations of the uterus, penetration of hydatidiform mole, over-distention due to multiple pregnancy, polyhydramnios, especially in the presence of scar, premature separation of the placenta, ventrofixation with extreme sacculation of the posterior lower uterine segment, version, internal podalic version, uncorrected breach presentation or pituitrin. Immediate revision of the uterus is in order after version. Both maternal and infant mortality rates are high. Recently a fatal case was reported of spontaneous rupture in the fourth month of pregnancy with no vaginal but intraperitoneal hemorrhage. Secondary rupture[33] is rare and occurs more frequently after the classical than after low section. Laparotomy may reveal conditions permitting suture of the scar, or necessitating removal of the uterus. Blood transfusion is recommended.

In cases of ruptured varix,[22] the mortality rate is very high if the patient is in labor. Only one case has been diagnosed prior to operation or autopsy. The symptoms are those of acute internal hemorrhage. Immediate transfusion and operation are indicated. Löhnberg reports a patient saved by hysterectomy. Six of the eleven cases reported in the literature were successfully treated by cesarean section.

Of course, lacerations due to trauma of the perineum, vagina and cervix will cause profuse bleeding and require surgical treatment.

Postpartum Hemorhage[10,13,16,21,24,25]

The causes[28,32,34,44] of postpartum hemorrhage include instrumental delivery, uterine atony, injuries sustained during the terminal portion of the first stage and during the second stage of labor, exhaustion or over-distention of the uterus, ill-judged sedation, too deep anesthesia, prolonged labor, premature separation of the placenta or retained placenta. A large baby, twins, multiple pregnancy or polyhydramnios may cause over-distention of the uterus. Relaxation of the uterus may occur as late as three weeks postpartum and one case was seen in which bleeding persisted for three months due to placental retention.

According to Conn,[8] a blood loss of more than 0.5 per cent of bodyweight constitutes postpartum hemorrhage. Shock is rare with a loss of 500 c.c. of blood unless there are other complications. Also the specific gravity of the blood may be taken as an index of the blood loss to be expected in the third stage of labor.

In prevention of postpartum hemorrhage one of the most important items is proper management of the third stage of labor. Conn is of the opinion that if the uterus is pushed into the pelvis, it should be elevated immediately after the placenta has been expelled, by combined vaginal and abdominal pressure if necessary. He injects ergonovine (0.2 mg. ergotrate) immediately after the birth of the baby and has observed no marked tendency of the cervix to contract or toward incarceration of the placenta as a result thereof. Placental separation is speeded up by this pro-

cedure. Davis[13,14] states that intravenous injection of ergonovine in the third stage of labor perfects the normal mechanism and the increased tonicity guards against further blood loss following placental separation. The tonicity is maintained for several hours thus preventing postpartum hemorrhage. He experienced a few cases of incarceration of the placenta but these could easily be treated at the hospital. Davis gives 0.2 mg. of ergotrate intravenously after the head is delivered and the anterior shoulder exposed. After twenty to thirty seconds, the baby can be delivered. The uterus must be contracted before expression of the placenta begins. The entire uterus must not be pushed down into the pelvis because such a procedure leads to profuse hemorrhage. Davis states that exerting pressure with the fingers of the left hand just above the symphysis, while the right hand pushes down on the uterus may help to avoid such a result. Slight traction on the cord will deliver the placenta when it is presenting at the introitus.

Hunt[18] emphasizes the importance of simple measures. For cases in which simple expression does not suffice to deliver the partially separated placenta, he uses a Crede procedure. If this fails the placenta is removed manually and the uterus packed with iodoform gauze. For hemorrhage immediately following the third stage of labor, the uterus is massaged. Bimanual compression is applied and ergonovine administered. If this fails, the uterus and vagina are packed and if hemorrhage still persists tamponade is repeated, after which in case of continued bleeding hysterectomy is performed. Manual removal of the placenta should not be delayed until the patient is exhausted from loss of blood. Adequate blood replacement is indicated. Hunt emphasizes the non-obstetric methods for control of postpartum hemorrhage including blood replacement by transfusion of blood, plasma or other blood substitutes such as placental blood, saline or glucose solutions, and acacia solutions. He discusses vasoconstrictors, the importance of preventing shock levels of blood pressure for more than twenty minutes, of using positive pressure for giving solutions in states of shock and the dangers of administering saline solutions in toxemia and glucose solutions in diabetes. He urges that efforts be directed toward early control of hemorrhage, as even the life-saving transfusion of blood carries with it possible risk to the patient.

It has been stated that postpartum hemorrhage has been observed with much less frequency after the introduction of the use of pituitrin in the third stage of labor. McGee[25] has been unable to confirm any acceleration of involution following administration of ergotocin and has observed several cases with severe reactions. The latter may occur also after administration of pituitrin. Navratil[28] uses hot vaginal and uterine irrigations if bleeding persists after evacuation and massage of the uterus. In cases of severe atony, aortic compression for ten to fifteen minutes at a point not higher than the level of the third lumbar vertebra may prove useful.

Briscoe and Wilson[7] have obtained satisfactory results by injection of 1 c.c. of pituitrin directly transcervical into the lower uterine segment (firm contractions may thus be produced in eighty-four seconds). The substance is injected into the wall of the uterus to a depth of 2-3 cm. in the anterior fornix. Hoyt[17] describes intra-abdominal injection of pituitrin into the uterine wall in emergency cases.[36]

The necessity for distinction between shock due to hemorrhage and genuine shock both as regards diagnosis and treatment is repeatedly indicated.[39] Shock often persists after hemorrhage has ceased and is not always in proportion to the degree of hemorrhage. The first stages of shock may be masked by the acute stimulation of the operation, ergot, pituitrin, analeptics and cardiacs. Two hours later alarming shock may develop, lasting from six to twelve hours. The pulse is misleading but the facies and warmth of the extremities indicate a good prognosis in cases in which the pulse is poor. Schaefer[39] recommends blood transfusion followed by continuous drop infusions for the treatment of shock. He states that it is the continuous and prolonged administration rather than the quantity of blood transfused that is the determining factor. Schaefer uses the central and peripheral drugs alternately, giving veritol after preliminary blood transfusion and drop infusion. He also warns against rapid succession of individual doses.

With the large number of articles appearing in medical journals on the control of postpartum hemorrhage, including advances in the technique of treatment and diagnosis as well as in the

knowledge of the underlying causes of the hemorrhagic condition itself and of reactions to the various drugs and procedures used, it is to be hoped that obstetricians may profit by the example of speeded up organization and application of findings set by the War Program.

A brief review of suggestions obtained from the literature seem to hold some promise for a further reduction of mortality rates in this field. To begin with let us stress the need for full use of facilities for prompt blood replacement, whether by autoinfusion,[11,31] blood transfusion or infusion of blood substitutes such as plasma, placental blood,[3] saline, glucose or acacia solutions with due regard for proper timing and contra-indications presented by various diseases as well as careful attention to proper matching of bloods and vigilance for detection of the recently emphasized Rh-factor.[18] It has been emphasized that saline infusions or plasma may suffice to tide the patient over until blood transfusion is possible. Likewise it has been stressed that it is the prolonged and continuous support[39] of the circulation by drop infusions following transfusion that are a determining factor rather than the actual amount of blood injected. Frequently massive fatal hemorrhage is preceded by minor hemorrhage, and careful utilization of the time interval between the two in adding to the patient's blood reserve may save life.

Routine roentgen studies and whenever possible permanent records in the form of lantern slide libraries should be encouraged, as also routine measurements of the specific gravity of the blood shortly before delivery and of the amount of blood lost. Careful differential diagnosis and differential treatment for genuine shock and shock due to hemorrhage must be indicated. Records should also be kept of the results of various forms of treatment for the different types of hemorrhage to permit correct evalution and more thorough standardization of techniques without sacrifice of individualization.

It is claimed that the tendency to bleed is greater in anemic blondes and red haired individuals than in brunettes. In spite of an alleged greater tolerance for blood loss in parturients the reaction to blood loss varies individually. Shortening the third stage of labor by means of pituitrin and ergonovine administered in the placental stage seems to diminish the tendency to postpartum hemorrhage.

The sulfonamides[20] have been indicated in a few instances as prophylactics in cases of feared infection, and for uterine packs.[2] Several articles indicate the need for more careful technique in packing of the uterus.[4] The use of analgesics should be limited to the earlier stages of labor so that they may not interfere with proper contraction of the uterus.

It has been emphasized that many deaths are due to application of usual methods for combating postpartum hemorrhage in cases of uterine apoplexy, in which the uterus can no longer respond to stimulation. Here operative treatment is indicated if the apoplexy extends beyond the genital system, as it frequently does because the underlying pathology is probably a toxemia. The latter must be prevented by proper prophylactic hygienic and dietetic treatment during pregnancy. Among the general measures and substances used prophylactically and therapeutically in obstetric hemorrhage may also be mentioned ice-bags, the vitamins E, C, and K and the oral or intra-uterine administration of gelatine, calcium and quinine.

Case Reports

Case 1.—Mrs. C. J. S., aged twenty-six, gravida 3, had her last menstruation April 20, 1940. When she was three and a half months pregnant, there was a spontaneous gush of fluid with bleeding, which lasted for three days (estimated blood loss 300 c.c.) without pain. The patient remained in bed for a week, after which the fluid loss and bleeding ceased and she was able to resume her household duties. She carried to term, delivering a full term, normal male child. The amniotic fluid obtained at delivery amounted to about 45 c.c. The placenta was expressed (Crede), Schultze's mechanism, measuring about 18 x 20 cm. and weighing 610 gms. The cord measured 60 cm. The attachment was lateral. The amount of blood lost was 900 c.c. The area where the rupture occurred in the membranes was sealed by fibrin. The fibrin clot measured 6 x 7 cm.

Diagnosis: Hemorrhage due to spontaneous rupture of the membranes, carried to term.

Case 2.—Mrs. F. J. R., aged thirty-seven, gravida 8, was admitted to the hospital December 5, 1938, because of bleeding which started one week previous. She had her last menstrual period July 8, 1938, and her confinement was calculated for April 15, 1939. Her clothes suddenly became soiled. On examination she found the fluid mixed with blood. The escape of fluid and blood recurred every forty-eight hours and at night. She suffered some abdominal discomfort after the initial showing, which subsided when the fluid passed.

Physical examination was negative except for enlargement of the abdomen to the size of a five months' gestation. There was a vaginal discharge mixed with blood. Upon x-ray of the abdomen, the placenta could not be outlined. The breech was presenting. Red blood count 3,500,000; white blood count 11,000; hemoglobin 62 per cent.





Fig. 1. *(left)* Photograph of the placenta and membranes (Case 1), showing site of spontaneous rupture of the membranes which was closed by deposit of fibrin.

Fig. 2. *(right)* Photograph of placenta (Case 2), showing the collar-like attachment of the membranes about the origin of the cord.

The placental souffle could be heard with the stethoscope on the right side in the lower uterine segment. After four days in the hospital, the patient was discharged.

On February 6, 1939 the patient was readmitted to the hospital in labor. During her stay at home, small amounts of blood-stained fluid had escaped daily. Two days prior to her admission, she felt much better but the fetal movements were absent. She expelled two old blood clots prior to spontaneous delivery of a male child. The cord made four complete turns about the child's neck, with the cord slipped through the last loop, making a single tie about the neck. The child was cyanosed, and failed to respond to treatment, expiring after forty minutes. The placenta was expressed. It measured 13 x 15 cm. and weighed 450 gms. The cord measured 60 cm. Attachment was central. The membranes were reduced to a small, collar-like area about the attachment of the cord from premature separation about the periphery.

Diagnosis: Circumvallate placenta.

Case 3.—Mrs. F. B., aged forty-four, gravida 7, had her last menstrual period December 26, 1937, followed by severe headache, inability to sleep, and vomiting which was relieved by 10 per cent glucose intravenously, and repeated daily for four days. The patient improved. The headache subsided and she was able to sleep and retained her food. The general physical findings were negative, except for the enlargement of the uterus. Her progress was satisfactory up to five months when her abdomen became soft and began to decrease in size, with loss of appetite and headaches lasting about two weeks. Her appetite then improved and she felt well. In April, 1938, she had a showing which lasted for four days. On October 16, she started to bleed, and this continued for two weeks. On November 26, there was moderate bleeding, followed next day by profuse hemorrhage which had to be controlled by a vaginal pack. As the hemorrhage recurred the following day, the uterus and vagina were repacked, and she was given 1 c.c. each of ergotrate and pituitrin in 1000 c.c. normal saline, by hypodermoclysis. Blood pressure 94/68; red blood count 3,480,000; white blood count 13,000; hemoglobin 66 per cent. The patient was typed for transfusion. On November 29 the pack was removed and replaced. Severe contractions followed with expulsion of the placenta. The placenta was oval in shape and the membranes were intact. It measured 8 x 10 cm., 2.5 cm. thick and weighed 130 gms. The membranes were opened but there was no evidence of a fetus. The blood loss could not be estimated, because the blood was absorbed by pads. Recovery was uneventful. Blood picture before discharge showed red blood count 3,400,000; white blood count 11,800 and hemoglobin 68 per cent.

Diagnosis: Missed abortion.

In a study of the records in the St. Cloud Hospital for the past two years, in over 1,500 deliveries where ergotrate was given only four manual deliveries of the placenta were recorded. The records do not state whether the removal was due to incarceration or to the use of ergotrate.

In a review of 500 of my own cases I find that the placenta was removed three times: once where the placenta was attached to the lower uterine segment and twice where there was a tubal pregnancy of the interstitial portion of the tube. The history shows there was early bleeding which subsided without interruption of preg-

nancy. On attempted removal, the placenta was located in the horn of the uterus like a pocket in a billiard table with a portion of the placenta attached to the posterior uterine wall.

References

1. Alexander, J. N.: Spontaneous rupture of the uterus in the fourth month of pregnancy. Am. J. Surg., 49:138, (Jan.) 1943.
2. Anderson, H. E., Gardner, H. L., Gunderson, M. F., and Slack, J. M.: Use of uterine packs impregnated with sulfanilamide. Am. Jour. Obst. & Gynec., 43:310, 1942.
3. Barton, F. E.: Economy in placental blood. Mod. Hosp., 54-61, 1940.
4. Belson, M. O.: Technique of uterine pack. Am. J. Surg., 50:589.
5. Boulware, T. M.: Abruptio placentæ: report of 90 cases. J.M.A. Alabama, 11:383, 1942.
6. Burkons, H. F.: Rupture of the uterus. Am. J. Obst. and Gynec., 42:75, 1941.
7. Briscoe, C. C., and Wilson, R. A.: Emergency control of postpartum hemorrhage, Injection of pituitrin into uterus. Am. J. Surg., 54:634, 1941.
8. Conn., L. C., Vant, J. R., and Cantor, M. M.: Critcial analysis of blood loss in 2,000 obstetric cases (relation to specific gravity of the blood). Am. J. Obst. and Gynec., 42:768-785, (Nov.) 1941.
9. Cooke, W. R.: Unusual hemorrhage in pregnancy: hydatidaform mole, adherent placenta, rupture of the uterus. Proc. Am. Cong. Obst. and Gynec. (1939), 1:326-330, 1941.
10. Corbet, R. M.: Postpartum hemorrhage with special reference to partial detachment of the placenta. Brit. M.J., 2:438-441, (Aug. 26) 1939.
11. Cordovil, A.: Autotransfusion in ruptured ectopic pregnancy. Results in 67 cases. Rev. Med. cir. de Brasil, 46:1209;1230, (Dec.) 1938.
12. Damm, P. N.: Thrombopenia in pregnancy. Nord. Med., 8:2063-2066, (Nov. 16) 1940.
13. Davis, M. E.: Postpartum hemorrhage. Am. J. Surg., 48:154, 163, (Apr.) 1940.
14. Davis, M. E., and Boynton, M. W.: Use of ergonovine in the placental stage of labor. Am. J. Obst. and Gynec., 43:775, 1942.
15. Finkestein, C.: Massive hemorrhage from episiotomy (case). Illinois M. J., 76:482-483, (Nov.) 1939.
16. Gesenius, H.: Postpartum hemorrhage. Med. Klin., 36: 1358-1360, (Dec. 6) 1940.
17. Hoyt, D. F.: Pituitrin (posterior pituitary preparation) in postpartum hemorrhage; transabdominal intra-uterine injection. J. Michigan M. Soc., 40:217-218, (March) 1941.
18. Hunt, A. B.: Obstetric hemorrhage. Minnesota Med., 26: 355, 1943.
19. Jeffcoate, T. N. A.: Missed abortion and missed labor. Lancet, 1:1045, 1940.
20. Johnson, C. G., and Talbot, J. D.: Use of sodium sulfathiazole in the treatment of septic abortions. Am. J. Obst. and Gynec., 45:846, 1943.
21. Litzenberg, J. C.: Postpartum hemorrhage. Proc. Am. Cong. Obst. and Gynec. (1939), 1:254-257, 1941.
22. Lohnberg, E.: Hemorrhage from subserous varix of uterus during first stage of labor. Western J. Surg., 47:626-628, (Nov.) 1939.
24. McArthur, J. H.: Postpartum hemorrhage caused by intrauterine leiomyoma. Canadian M.A.J., 41:68, 1939.
25. McGee, H. D.: Postpartum hemorrhages and associated problems. Minnesota Med., 26:363, 1943.
26. Miller, J. K.:: Role of cesarean section in the treatment of premature separation of the normally implanted placenta. Am. J. Obst. and Gynec., 42:745, 1941.
27. Miller, R. S.: Vitamin C. in abortions associated with blood dyscrasias. Am. Jour. Obst. and Gynec., 45:363, 1943.
28. Navratil, E.: Postpartum hemorrhages and their treatment. Wien. klin. Wchnschr., 54:683-684, (Aug. 8) 1941.
29. Olivella, J. Ramirez: Management of placenta abruptio. J. Internat. Coll. Surgeons, 4:385-392, (Oct. 19) 1941.
31. Page, E. W.: Suitability of extravasated blood for reinfusion. Comparison of venous and abdominal blood in extra-uterine pregnancy. Western J. Surg., 49:603-605, (Nov.) 1941.
32. Petkar, R. G.: Postpartum hemorrhage. Indiana M.J., 35:234-240, (Oct.) 1941.
33. Pettit, R.: Repeated secondary rupture of pregnant uterus. Am. J. Obst. and Gynec., 45:334, 1943.
34. Picot, H.: Postpartum hemorrhage. Virginia M. Monthly, 68:154-156, (March) 1941.
35. Rauramo, M. and Kahanpaa, V.: Therapeutic principles in uteroplacental apoplexy. Acta. obst. et gynec., Scandinav., 20:243-292, 1940.
36. Ravina, J.: Intra-uterine injection of posterior pituitary extract through the abdominal wall in treatment of hemorrhage in the third stage of labor. Medicine, 20:309-314, (April) 1939.
37. Reeves, B. J.: Treatment of antepartum hemorrhage. J. Arkansas M. Soc., 36:221-225, (March) 1940.
38. Rutherford, R. N.: Significance of hemorrhage in early pregnancy as evidenced by decided biopsy. Surg., Gynec. & Obst., 74:1139-1153, 1942.
39. Schafer, G.: Results of hemorrhagic placenta previa and prophylactic measures. Zentralbl. f. Gynak., 64:1128-1133, (July 6) 1940.
40. Schteingart, M., and de Uryson, T. C.: Hemorrhagic diathesis of scorbutic origin with onset during labor; case. Bol. Inst. de Matern., 8:110-116, (July) 1939.
41. Sheehan, H. L.: Blood transfusion for obstetric hemorrhage and shock. Lancet, 1:616-618, (May 23) 1942.
42. Shute, E.: Vitamin E and premature labor. Am. J. Obst. and Gynec., 44:271, 1942.
43. Stander, H. J.: Treatment of bleeding in first and third trimesters of pregnancy. Am. J. Obst. & Gynec., 44:531, 1942.
44. Studdiford, W. E.: Postpartum hemorrhage. Proc. Am. Cong. Obst. and Gynec. (1939), 1:151, 1941.
45. Vartamo, F.: Vaginal and vulvar hematomas in connection with labor. Acta Soc. med. fenn. duodecim (Ser. B., fasc. 3), 28:1, 1940.
46. Wallace, J. T.: Uterine bleeding in the last trimester of pregnancy. Diagnostic significance and treatment. Am. J. Obst. and Gynec., 40:128, 1940.
47. Whitacre, F. E., and Fang, L. Y.: Management of rupture of the uterus. Report of forty-four cases. Arch. Surg., 45:213, 1942.
48. Wilson, C. L.: Bleeding in the third trimester, J. Nat. M.A., 32:206, 1940.

HEMORRHAGE IN THE MENOPAUSE

LAWRENCE M. RANDALL, M.D.

Rochester, Minnesota

IN the latter part of the menstrual life of women, variations of the menstrual flow are to be expected as a consequence of failure of the function of the ovaries. The menstrual interval may be shortened or lengthened, and the amount of flow increased or decreased. Certain benign lesions may cause similar changes. Occasionally, such changes may be encountered in the presence of a malignant lesion. More frequently, the latter gives evidence of its presence by bleeding between the regular flow, intermenstrual spotting or metrorrhagia. However, the type of atypical bleeding from the genital tract is not sufficiently characteristic to allow a diagnosis of the cause to be made without a careful examination of the pelvic viscera. As will be indicated, this examination must proceed in a more or less orderly

From the Section on Obstetrics and Gynecology, Mayo Clinic, Rochester, Minnesota.

Read at the annual meeting of the Minnesota State Medical Association, Minneapolis, May 18, 1943

sequence until satisfactory cause or causes have been established. For example, it should be remembered that fibroids and cancer, or senile vaginitis and cancer may co-exist.

The minutiæ of bimanual examination are familiar to all physicians. After the bladder and rectum have been emptied, the patient should be placed on the examining table in as comfortable a position as possible. Gentleness on the part of the physician and complete relaxation on the part of the patient will contribute greatly to an accurate investigation. Perhaps examination through the rectum is not performed as frequently as it should be. By this means the bases of the broad ligaments, the cul-de-sac of Douglas and the regions of the tubes and ovaries often can be felt more satisfactorily than through the vagina. Examination of the patient in the knee chest position gives valuable information. The vaginal walls and uterine cervix should always be inspected through a speculum. The ordinary bivalve speculum is usually satisfactory; however, the tubular, or Ferguson, speculum has certain advantages. When the largest size that can be introduced is employed, it permits complete visualization of the cervix as well as of the anterior, posterior and lateral vaginal fornices. When the instrument is withdrawn slowly, the vaginal wall can be completely visualized as it rolls over the edge of the speculum. If any portion is suggestive of a malignant lesion, a specimen should be removed for microscopic examination. Schiller's test, made by applying compound tincture of iodine to lesions, and the use of the colposcope are frequently mentioned as part of the examination. I have little faith in the former and believe that the only safe procedure is microscopic examination. It is true that the application of a solution of iodine to the cervix may afford a better notion as to the region from which a specimen should be removed for microscopic study. Malignant lesions do not stain with the solution owing to a lack of glycogen, which is present in normal tissue. Such a failure of staining may be noted in the presence of cervicitis without malignant change. When tissue is obtained for microscopic study, several specimens should be removed. The depth of the specimen should include all the layers of tissue under suspicion. One must be trained in the use of the colposcope. A good one is expensive and, while it may aid in selecting a region for study, it is not possible to make a definite diagnosis with this instrument without microscopic examination.

If no adequate cause of the bleeding is observed in the vagina or on the cervix, the cervical canal should be probed. If bleeding occurs after this procedure, a specimen for biopsy should be obtained from this region.

If atypical bleeding occurs from the genital tract and if no cause for the bleeding can be found in the vagina or cervix, one must perform a dilatation and curettage for diagnostic purposes. This should be done with the patient under anesthesia and the uterine cavity should be curetted thoroughly. The cannula curette used for removal of tissue in the office for determination of the histologic structure of the endometrium has no place in the diagnosis of pathologic conditions of the endometrium. All scrapings should be examined under the microscope by a competent pathologist. Preferably, this examination should be made, by the frozen section technique, while the patient is under anesthesia, in order that further treatment, if indicated, may be carried out immediately. One is likely to consider diagnostic dilatation and curettage as a final and complete method of excluding carcinoma of the body of the uterus if negative results are obtained. In the main, this is true; however, if intermenstrual spotting of blood has occurred, if postmenopausal bleeding is present, or if the uterus is somewhat enlarged and soft, it may be good judgment to remove the uterus, even if microscopic examination does not reveal evidence of malignancy. Under these circumstances, one not infrequently will find an intra-uterine polyp or small carcinoma that has been missed with the curette. Postmenopausal bleeding occasionally is encountered in cases in which the pathologist finds evidence of proliferation of the endometrium in the scrapings obtained by curettage. This should lead to the suspicion of a granulosa cell or a theca cell tumor of the ovary.

In the majority of cases in which atypical bleeding occurs from the genital tract in the latter years of the menstrual life of women, the bleeding will be due to benign lesions. These are: prolapse of the urethral mucosa with meatitis, urethral caruncles, vaginal infections due to Trichomonas and Saccharomyces, senile changes in the vaginal mucosa, cervicitis with ectropion, cervical polyps, benign proliferation of the endometrium, uterine polyps, submucous fibroids, re-

tained secundines, and an atrophic endometrium.

Prolapse or eversion of the urethral mucosa or a urethral caruncle associated with meatitis occasionally is the only reason for bloody spotting. A caruncle should be removed by fulguration. The prolapsed mucosa usually is best left alone if the meatitis can be corrected by local treatment.

Infections of the vagina need not be considered in detail. Their diagnosis and proper treatment have been considered frequently and extensively. It may be mentioned, however, that when these infections occur in a senile vaginal mucous membrane their treatment may be more difficult because of the poor condition of the infected tissue. Frequently, sufficient estrogenic substance to afford rehabilitation of the mucous membrane of the vagina will facilitate the treatment usually employed. Indeed, in the case of infection by Trichomonas, this may be sufficient treatment.

One not infrequently sees bloody spotting due solely to the senile changes in the vaginal mucosa. The picture is quite characteristic. The tissue is thin and pale and it may be diffusely reddened. Petechial regions are numerous and slight trauma with an applicator or the edge of the speculum will produce an oozing of blood. Other sources of bleeding should be kept in mind and excluded. If, after treatment, the bleeding disappears and if subsequent examination of the pelvis gives negative results, the senile changes may be considered the source of the bleeding. The condition may be treated by the oral, local or intramuscular administration of estrogens. I prefer to use stilbestrol in doses of 0.25 or 0.5 mg. given daily for three or four weeks. This will usually control the condition although subsequent courses of treatment may be necessary.

Cervicitis with ectropion and erosion may cause intermenstrual bleeding. The cervix should be adequately visualized and carefully inspected. A specimen of the lesion should be examined microscopically before treatment is instituted. Treatment depends on the extent of the lesion. The ordinary cervicitis can be well treated in the office by a nasal tip cautery. If marked hypertrophy and laceration are present, conization, deep surgical cautery, a Sturmdorf operation or amputation are preferable.

Cervical polyps are usually benign. However, malignant change is encountered just often enough for one to recommend the removal of all cervical polyps, which should be followed by microscopic study. Polyps are liable to be multiple, and careful search of the cervical canal should follow the removal of a polyp. The polyp should be grasped with a forceps. The base of the polyp should be severed with the actual cautery and thoroughly destroyed. Failure to do this leads to recurrence.

One must condemn the practice of the treatment of atypical bleeding from the uterus in the latter half of the menstrual life without diagnosis of the cause. Before the menses have ceased, if careful pelvic examination gives negative results and if the patient may be kept under control, a period of observation is allowed. After cessation of menses, if examination of the pelvis gives negative results, except for an obvious senile vaginal mucosa that is bleeding, a period of observation and treatment of this condition may be permitted. It is very bad medical practice to give a woman "shots" for menstrual irregularities when she has reached the age of the menopause, unless cancer has been excluded. If cancer has been excluded and if radical treatment with radiation or operation is not indicated by the patient's general condition, such as a severe anemia, I can see no harm in a trial of hormonal therapy but do not have much faith in success. In many of the cases, atypical bleeding is caused by failure of function of the ovary owing to senescence of this gland and no amount of stimulation of the ovary will have much chance of producing a beneficial effect. Preparations of male hormone, testosterone propionate, are currently employed and at times are beneficial. It must be borne in mind that masculinizing effects may occur and that these are undesirable from the patient's standpoint. It has been stated that no more than a total of 1,000 mg. should be used. This may be given in doses of 20 to 50 mg. twice a week. An average monthly dose is 300 mg.

Cancer of the uterine cervix frequently announces its presence by an intermenstrual or postmenopausal bloody discharge. Yet all too frequently one sees advanced carcinomas, certainly detectable long before by examination, that have escaped the patient's attention because none of the early signs such as leukorrheal discharge and blood have been noticed. Principally, this condition is treated by a combination of radium and roentgen rays. In a small number of cases in which Stage I lesions are present, a Wertheim

hysterectomy may be performed and radiation employed subsequently.

The treatment of carcinoma of the body of the uterus is fairly well standardized and consists of total abdominal or vaginal hysterectomy. Exception occurs when the lesion has metastasized, a complication which fortunately occurs late in the course of the disease, or when the condition of the patient makes the risk of surgical treatment excessive. Then treatment by radiation may be employed.

The treatment of atypical bleeding from the body of the uterus due to benign conditions such as fibromyomas is less standardized. All physicians probably would agree that a diagnostic dilatation and curettage followed by the intrauterine application of 1,200 to 1,600 mc. hours of radium or a dose of roentgen rays sufficient to obliterate function of the ovaries is good treatment for menorrhagia caused by hyperplastic endometrium or submucous fibroids in a case in which the patient is forty-five to fifty years of age, if the uterus is no larger than one that contains a three-month fetus. The patient is at the end of her period of ovarian activity. Such treatment succeeds in the great majority of cases of this type.

What about the same circumstances in a case in which the woman is thirty-eight years of age? Treatment with radiation precipitates the menopause. It has been shown that further bleeding will occur in 30 to 40 per cent of cases in which women less than forty years of age are treated by the means just mentioned. Bleeding is much more likely to develop subsequently if menopausal symptoms need treatment by the administration of estrogens. It seems to me that hysterectomy with preservation of the ovaries is much more sensible treatment for persistent atypical bleeding from the uterus in this group of cases.

One of the most difficult gynecologic opinions concerns enlargement of the ovary in the case of older women. Cancer of the ovary is most frequently seen between the ages of forty and sixty-five years. It does not announce its presence by bleeding from the uterus in many cases. It is detectable in the early stages only by careful examination of the pelvis. This should lead physicians to educate their patients concerning the value of periodic examinations of the pelvic viscera during this period of life. It has been recommended that this be done yearly or at intervals of six months. I do not believe that significant or satisfactory progress in the early diagnosis of cancer of the pelvic viscera of women will be made until this program is carried out. No amount of education confined to the description of the early symptoms of cancer will accomplish much. Every large and easily diagnosed ovarian tumor was once small. If atypical bleeding from the genital tract occurs during the latter part of menstrual life or if postmenopausal bleeding is associated with significant enlargement of the ovary, exploration of the pelvis is to be considered seriously. A period of observation and repeated examinations may be employed before making this decision. Naturally, one must keep in mind other causes of bleeding, for multiple causes may be present.

Summary

Atypical bleeding from the uterus in the latter part of the menstrual life is a significant symptom. Bleeding that occurs from the genital tract after the cessation of menses is increasingly significant. Every woman who consults a physician because of such symptoms should receive a careful and complete diagnostic survey. One should advocate periodic examinations of the pelvic viscera and not rely solely upon education of the laity concerning the early symptoms of cancer—all too frequently there are none. The treatment of atypical bleeding from the genital tract of women without adequate diagnosis is to be condemned severely.

AMERICAN MILK

Milk helps American boys in military service attain high nutritional standards; it reaches Great Britain as cheese; Russia as butter; China and Africa as powder; French youngsters in evaporated form.

Total U. S. farm milk production reached 55,460,000,000 quarts in 1942. The 25,159,000 cows on farms each produced an average of 2,204 quarts of milk. In addition to the 22,992,000,000 quarts consumed as fluid milk and cream, U. S. milk was used for making 1,779,465,000 pounds of creamery butter; 917,310,000 pounds of cheddar cheese; and large amounts of other cheeses, ice cream and other dairy products.

Milk is the largest single source of farm cash income and was 15 per cent of all farm income in 1942—larger than cattle or hogs, twice cotton, three times wheat, five times tobacco.

"Americans enjoy the best milk in the world," it is said, "with sanitary safeguards and widespread distribution that make this milk supply an invaluable asset in wartime."

EXPERIENCES WITH THE Rh SUBSTANCE IN TRANSFUSION REACTIONS

R. W. KOUCKY, M.D.

Minneapolis, Minnesota

THE knowledge of the Rh substance made available by the studies of Landsteiner, Levine, Wiener, and others,[13,15,16,23] has contributed materially to the identification and prevention of transfusion reactions. These new data should rightfully be received with enthusiasm but at the same time they should not obscure in any way the many lessons previously learned regarding the successful management of blood transfusions. This new information is one more forward step comparable to identification of pyrogen reactions, popularization of citrated blood or development of blood storage.

The Problem in General

The following two cases are briefly summarized to illustrate the general nature of the reactions due to Rh sensitization.

Case 1.—This patient was admitted to the hospital because of a pelvic mass. On exploration, a carcinoma of the ovary was found and resected. During the operation, the patient received a transfusion of 500 c.c. of blood without any reaction. Sixty days later, the patient returned to the hospital for a second transfusion at which time the original donor again offered to give blood. The crossmatching done by the Levine method showed marked agglutination of the prospective donor's cells.

Case 2.—A woman near term was delivered by cesarean section. The obsterical history and indications for the section were not stated by the referring physician. A transfusion of group 0 blood from the husband was given at the time of the surgery. The patient suffered a reaction consisting of chills, fever, jaundice and oliguria. She recovered. The bloods were rechecked and were of compatible groups.

Comment.—These two cases illustrate the general character of the reactions due to Rh sensitization. They occur in spite of the use of group compatible blood and they occur after a prior transfusion or during pregnancy.

The Rh Substance

Human blood contains many specific substances[1,5] of which only a few are of interest to physicians. The A and B substances are well known since they are responsible for the division of bloods into the four blood groups: AB, A, B, O (Moss groups 1, 2, 3 and 4, respectively). The M and N substances are useful in medicolegal problems and very rarely are involved as a cause of transfusion reactions.[12,25] Until recently, the Rh substance had no clinical application and for this reason, like most of the other specific blood substances, was unknown to physicians. Now that the significance of the Rh substance has become apparent, a knowledge of its properties has become important.

No definite direct information is yet available relative to the physical properties of the Rh substance. Presumably, like the A and B substances, it is a carbohydrate fixed to the protein of cells. It is fixed to the red blood cells and as yet has not been identified in any of the other body tissues[14,18] although the evidence indirectly indicates that the Rh substance should be present in other tissues, particularly in the liver. It is not present in commercial serum or plasma[10] (see Case 8). Approximately 85 per cent of individuals possess this Rh substance as a normal constituent of their red blood cells. This group is spoken of as Rh positive. Fifteen per cent of people do not have this substance and this group is known as Rh negative.

Although the general principle of sensitization to the Rh substance is simple, the specific details are very confused. Rh positive individuals already have the substance as part of their blood and are not affected by any further addition of it to their bodies. On the other hand, Rh negative individuals do not have this substance in their blood and if it is introduced into their bodies, they react to it as though it were a foreign protein. After an "incubation" period of variable length, they develop antibodies against the Rh substance.

The Rh substance can be introduced into the Rh negative individual in two ways: by transfusion of Rh positive blood or by a pregnancy in which the fetus is Rh positive. Rh negative patients transfused with Rh positive blood have no reaction from the first transfusion but if they are again transfused with Rh positive blood after

they have formed antibodies, they develop a reaction. An Rh negative woman who bears an Rh positive fetus may become sensitized during the pregnancy and if she is transfused with Rh positive blood she will develop a reaction during the first transfusion.

The Rh positive child born of such a sensitized mother shows the syndrome known as erythroblastosis.[11,16] The maternal antibodies pass through the placenta and combine with the fetal antigen. This union in the fetus produces hemolysis and cellular damage to capillaries, liver and sometimes to the brain. The hemolysis results in jaundice, anemia, hyperplasia of blood forming tissues and immature red cells in the circulating blood. The cellular damage produces edema, petechial hemorrhages and sometimes necrosis of the liver and degeneration of brain cells.

The syndrome is extremely variable. The child may be born prematurely or born dead. If born alive, the child may show distress at birth or may live for several days before clinical symptoms appear. Occasionally, the disease manifests itself only as an anemia which may not be apparent until many days or weeks after birth. This syndrome presenting itself in the child or evident from the past history of the mother is an extremely valuable warning to the clinician that the woman may be Rh negative and sensitized to Rh positive blood. Not all erythroblastosis is due to Rh sensitization so that the occurrence of this syndrome in the infant is not absolute evidence that the mother is Rh negative and sensitized.

The various blood substances, Rh included, are in the broad sense of the word, antigens: that is "when introduced parenterally into an animal, will cause the production of antibodies."[2] However, when introduced into humans, these substances act very irregularly. The A and the B substances are strong antigens and if introduced into the body by intention or by transfusion of incompatible blood consistently stimulate the formation of antibodies.[1,19,26] The M substance will stimulate antibody formation only in very exceptional instances.[12,25] The Rh substance is intermediate in this respect. In some Rh negative individuals, the substance is a powerful antigen and stimulates a high titre of antibodies. In other people, the substance is either nonantigenic or very slightly so.[24,27] The following case illustrates the powerful antigenic property exhibited in some individuals.

Case 3.—This woman had had one normal Rh negative baby. Her next two pregnancies resulted in stillborn, premature infants, both dying of erythroblastosis. She was referred for study by her physician during the third month of her fourth pregnancy. Her blood was group A and Rh negative. The husband was a group 0 and Rh positive. Her serum agglutinated most Rh positive bloods. Her serum was studied at monthly intervals throughout her pregnancy. The anti-Rh titre ranged as high as 1 to 250. The child died soon after birth of the hydroptic type of erythroblastosis. On the sixth postpartum day the anti-Rh titre rose to 1 to 5,000. (This case will be reported in detail elsewhere.)

Considerable evidence can be accumulated to show that the Rh substance is weakly antigenic or not antigenic in some people. A study was made of the Rh status of the mother and child in 200 normal deliveries. Blood smears were made on all the babies. All, with the exception of one premature child, had less than seven nucleated red cells per 100 white cells. The premature child maintained a hemoglobin of over 17 grams. In other words, none of these babies showed any evidence of erythroblastosis. Twenty-six of these mothers were Rh negative and their babies were Rh positive. In sixteen of these mothers, serum was studied between the fifth to the eighth postpartum day. Three of these sixteen showed traces of antibodies and were presumably sensitized to a degree which, however, was too mild to affect the child. Twelve of the twenty-six mothers were multipara and had previously delivered a total of twenty-one normal children. Two had had one miscarriage, each in the early months of pregnancy, and none had had an erythroblastotic child. This group of twenty-six Rh negative women with Rh positive babies could have been inoculated with the Rh substance during their pregnancy. However, none showed evidence that such inoculation, if it had occurred, stimulated any significant antibody formation. Since the manner in which the transfer of antigen from the fetus to the mother is unknown, there exists the possibility that not all of these women had been inoculated.

The general incidence of erythroblastosis likewise indicates that only a few Rh negative women exposed to the Rh substance during pregnancy are affected by the exposure. In the general population the theoretical occurrence of an Rh nega-

tive mother bearing an Rh positive child is about 9 per cent. However, the incidence of erythroblastosis which can be taken as a gauge of the frequency of significant sensitization is probably not over 0.5 per cent. Therefore, roughly, only about one in twenty Rh negative women exposed to the Rh substance during pregnancy react with antibody formation. However, those women who do develop antibodies usually do so with every Rh positive fetus. These circumstances strongly indicate that most Rh negative women are refractive to the Rh substance in the same way as the majority of all humans are refractive to the M or N substance.

Experience gathered from inoculation of Rh negative individuals with Rh positive blood by means of transfusion shows similar results. The following two cases serve to illustrate the poor antigenic power in some individuals.

Case 4.—A young woman injured in an automobile accident was admitted to the hospital in deep shock. She had multiple fractures and a rupture of the urinary bladder. Her blood was group A and Rh negative. In the next three days she received a total of 2,200 c.c. of Rh positive blood. Thirty-two days after the first transfusion, questionable traces of Rh agglutinins were present. On the thirty-sixth day, distinct traces were observed and these were absent on the sixty-fifth day. The donors' Rh positive cells were still present in her circulation.

Case 5.—The patient was admitted to the hospital for care of a duodenal ulcer. Shortly after admission, he developed a massive hemorrhage. The hemoglobin dropped from 16 grams to 6.3 grams. The patient was a group 0 and Rh negative. He was given 2,500 c.c. of Rh positive blood. He remained in the hospital forty-four days after the last transfusion. The Rh positive cells were still present in the patient's circulation at the time of discharge. The serum at one time showed questionable traces of Rh agglutinins but these traces were absent a week later.

Comment.—These two patients each received over 2,000 c.c. of Rh positive blood. These patients were studied for sixty-five and fourty-four days after receiving this inoculation. Neither showed any significant titre of antibodies.

It would appear that only about one in twenty Rh negative women bearing Rh positive infants develop significant antibodies. Also it appears that some individuals even after massive direct inoculation by transfusions do not develop demonstrable antibodies of any degree. One is forced to conclude that the Rh substance is not antigenic to all individuals. In spite of the evidence presented, one must reserve final judgment because this entire phenomenon of Rh sensitization is very complex and more experience is needed before a final conclusion is warranted. The following case suggests that factors still unknown may be involved.

Case 6.—This patient was admitted for repair of a cystocele and rectocele. Her last child was born twenty-three years prior. She had a total of four pregnancies, all ending in the delivery of normal children. There were no abortions, no stillbirths and no evidence of erythroblastotic babies. The patient was a group B and Rh negative. The Rh grouping of the husband was not done. Two of the four children were examined and these two were Rh positive. The patient was given 500 c.c. of Rh positive blood. Five days later, another transfusion was to be given. The Levine cross-matching showed distinct agglutination of cells from all of 10 Rh positive donors. By the fourteenth day after the transfusion, her serum produced marked agglutination of all Rh positive test cells.

Comment.—This Rh negative woman had four normal children. Two of these were examined and both were Rh positive. The exposure to the Rh substance during these pregnancies did not produce enough sensitization to cause erythroblastosis in the children. However, when inoculated with Rh positive blood twenty-three years after her last pregnancy, she promptly developed a marked antibody response. Because all of the processes involved in the phenomenon of Rh sensitization are not known, conclusions should not be arrived at too hastily.

The Rh Antibody

The antibodies formed against the Rh substance are present in the serum. They, like other antibodies, probably are proteins contained in the globulin fraction. It must be assumed that, as in similar antigen-antibody relationships, there are several types of antibodies produced: agglutinins, hemolysins, percipitans, cytotoxins and others. No fractionation of these different antibodies has as yet been accomplished. There is clinical evidence to indicate that there exists a multiplicity of antibodies and this variety of antibodies finds an important application to blood transfusions.

Case 7.—This woman had two prior stillborn children. Autopsy examinations had shown typical erythroblastosis in both. She was referred by her physician at about six weeks of her pregnancy. The examination showed that she was a group B and Rh negative. She

had no Rh antibodies in her serum at this time. The next examination at about ten weeks of pregnancy showed traces of Rh antibodies. She was seen periodically throughout her pregnancy and, after the examination at ten weeks, Rh antibodies could no longer be demonstrated. Shortly before delivery, a trace of antibodies again reappeared. The child at birth had a massive hydrops and died in a few minutes. After delivery, the Rh antibodies rose slightly so that definite traces were demonstrable.

Comment.—This woman, studied throughout her pregnancy, never showed more than traces of agglutinins, however, the child in utero suffered a profound reaction sufficient to induce the most severe form of erythroblastosis. It is obvious that this mother was forming antibodies yet none could be demonstrated by matching her serum against Rh positive red cells. Did the child in utero absorb all the antibodies as fast as they were produced by the mother? If this were true, the mother would have necessarily continued to form such antibodies after the termination of the pregnancy and they would have accumulated and been demonstrable after the separation of the child as in Case 3. The probability is very great that this woman formed hemolysins and cytotoxic antibodies which destroyed the fetus but that she did not form agglutinins. If this woman had been transfused with Rh positive blood, it seems very probable that she would have suffered a reaction even though no agglutinins were demonstrable.

In the laboratory, the tests for compatibility of bloods and for the presence of antibodies consist entirely of demonstration of agglutinins. It must be emphasized that the absence of demonstrable agglutinins does not preclude the absence of other antibodies capable of producing a serious reaction.

Case 8.—This patient was four months pregnant and was explored for an upper abdominal mass. An extremely vascular retro-peritoneal tumor was encountered which bled so profusely that the wound had to be closed over packs. Transfusions were given. The third and fourth transfusions of compatible group A blood caused severe reactions and both had to be discontinued. Blood was referred for study at this time. The patient was a group A and Rh negative. Only a few of the transfused cells persisted in the circulation. No Rh agglutinins could be demonstrated either at this time or on two subsequent examinations. While search was being made for Rh negative donors, an infusion of commercial serum was given without reaction. Plasma from a group A Rh positive individual was prepared and this contained a "few" red cells. Infusion of this fluid caused a reaction. Two more infusions of commercial plasma were given without reaction. By this time, Rh negative donors were found and two transfusions of this blood were given, both without reaction.

Comment.—This patient suffered reactions from Rh positive blood and from plasma contaminated with Rh positive cells. She had no reaction from commercial plasma or from Rh negative blood. Her serum studied over a three-week period after the last transfusion with Rh positive blood showed no Rh agglutinins. It appears clear that in spite of the absence of Rh agglutinins, this patient had other types of Rh antibodies capable of inducing reaction.

Other biologic properties of the Rh antibody have direct clinical application. The Rh agglutinin is slow acting and produces its effect best at body temperature. It is this slow activity and need for incubation which prevents the demonstration of these agglutinins in the usual open-slide method of examination. A special technique has been devised by Levine.[16,17]

The mixture of diagnostic antiserum and the unknown cells is incubated at 37° for one hour. The suspension may be examined at thirty minutes and if definite agglutination is visible, no further incubation is necessary. If the result is negative or indefinite, the final reading should not be made until the end of an hour's incubation. Bloods often will not show clear-cut reactions until fifty to sixty minutes incubation. At the end of one hour, the suspension is centrifuged at 500 R.P.M. for one minute. This packing sharply accentuates the agglutination. The mixture is resuspended by shaking, poured on a slide and examined immediately under the microscope. The long period of incubation often concentrates the serum so that the viscosity is increased and if the mixture on the open slide is left to stand for any length of time, pseudo-agglutination may be so marked that an interpretation is very difficult. Agglutination of the cell suspension indicates an Rh positive grouping. The cells from different individuals show a tremendous variability in the degree to which they clump. The same serum will give results varying from complete agglutination to slight clumping of two or three cells.

The cross-matching of the patient's serum with donor's cells is done in the same manner. The avidity of cells to agglutination varies greatly and often a weak serum will agglutinate only one

of many cell suspensions. In checking a patient's serum for antibodies it is necessary to cross-match against as many suspensions of group compatible cells as possible. If even one strain of cells is agglutinated the presence of Rh agglutinins is almost certain.

TABLE I. IRREGULAR AGGLUTINATION OBSERVED WITH DIFFERENT STRAINS OF Rh ANTISERA

	Serum			
Cells	L	M	C*	C2*
Mrs. C.	Plus	Plus	0	Plus
Mrs. T.	Plus	Plus	Plus	0

*C and C2: two separate strains of commercial antisera.

There is another property of the Rh antibody which is either identical with or related to the characteristic just described. A given strain of serum may yield a negative, or faintly positive, reaction with some cells and yet another serum, apparently of equal potency, may give a positive reaction. In other words, cells which are negative with one serum may be positive with a different strain of serum. This phenomenon has been observed by practically every investigator.[5,8,15,16,17] The commercial sera available to the average hospital laboratory also manifest this irregularity of agglutination (Table I).

The significance of this variability in clinical practice is very great. The cells of a prospective donor may be Rh negative with one strain of serum and yet actually be Rh positive. If such blood should be given to a sensitized patient, a reaction probably would occur. Before individuals are finally classified as Rh negative, the cells should be checked against several strains of serum. At least the two available commercial strains should be on hand in every laboratory.

Appearance of Antibodies.—The time when antibodies appear during pregnancy, or after the initial tranfusion of Rh positive blood, determines when reactions will occur. A study of pregnant women to establish a prenatal diagnosis of erythroblastosis or in preparation for transfusions has given some information relative to the time antibodies may be expected in pregnancy. This data is summarized in Table II.

It is apparent from Table II that antibodies may be present as early as the tenth week of pregnancy. If these sensitized women should be transfused with Rh positive blood, either because of anemia or a loss of blood attending an abortion, they would develop a reaction. The following two summaries illustrate this type of reaction.

TABLE II. APPEARANCE OF ANTIBODIES IN PREGNANCY

Patient	Weeks of Gestation*	Antibodies
W	12	Marked
C	8-10	Trace
La	12	Marked
B	(a) 6 (b) 10	0 Trace
M	(a) 10 (b) 14	0 Definite

*Historical.

Case 9.—This patient aborted at about twelve weeks of pregnancy. Because of anemia she was transfused from a sister. There was no reaction. About the tenth day after the abortion she was transfused from the husband. She developed chills and fever. Jaundice and oliguria were present on the next day. The oliguria improved and the patient finally recovered. The mother was a group A and Rh negative. The husband was a group A and Rh positive. The bloods were sent for study a few days after the transfusion. None of the donor's Rh positive cells remained in the patient's circulation. The serum strongly agglutinated all Rh positive cells.

Case 10.—This woman suffered an abortion at about ten weeks of pregnancy. She was admitted to the hospital for a transfusion. The admitting diagnosis was "secondary anemia" and no information was given to the laboratory relative to the recent pregnancy. No Rh studies or Levine cross-matching was done. Group compatible blood was given and the patient developed distress, fall in blood pressure and chills and the transfusion was discontinued. The blood studied a few days after the transfusion was Rh negative, all the donor's Rh positive cells were gone and Rh antibodies were present in low titre.

Comment.—These two cases are typical examples of reactions occurring from transfusions of Rh positive blood to women sensitized early in pregnancy. In Case 10 oliguria was present illustrating that such reactions may be severe.

The possibility of sensitization in very early pregnancy as in ectopic pregnancy has not yet been established. Hamilton and Martini[9] reported an increased hazard from such transfusions. In the course of this study there has been only one Rh negative woman with an ectopic pregnancy and this one was given three transfusions of Rh positive blood without reaction.

The time at which antibodies appear after transfusion was studied in seven cases and the results are summarized in Table III.

TABLE III. APPEARANCE OF ANTIBODIES AFTER TRANSFUSION

Patient	Positive Blood c.c.	Day of Appearance after first Transfusion
S	500	6
P	1,000	4*
F	2,500	28
C	2,200	33
G	1,500	14
A	1,750	32
H	1,500	9†

*Four months pregnant. Reaction developed on fourth day with the third transfusion.

†Ectopic pregnancy. Transfused three times in first two days without reaction.

In these few cases antibodies were demonstrable either by laboratory means or by transfusion reactions at times varying from four to thirty-three days. While this data is based on only a few cases, it nevertheless distinctly indicates that sensitization may develop as early as the fourth day after the initial transfusion. In one of Wiener's cases antibodies appeared on the fifth day.[23] In the case cited here, with antibodies on the fourth day, the patient was pregnant which may have hastened the appearance of the antibodies.

The persistence of antibodies after the sensitization stimulated by pregnancy has been studied quite extensively. Levine found that 50 per cent of the cases lost their antibodies within six months but that a few retained the sensitization for as long as 18 months.[16,18] Potter, Davidsohn, and Crunden[21] reported a case in which antibodies were demonstrable six years after the last pregnancy. In the group of patients in this study one had antibodies thirty months after the last pregnancy. Another is still strongly sensitized fifteen months after her pregnancy. In one case antibodies reappeared during a respiratory infection even though they had not been demonstrable during the prior six months. In one other case there was a distinct increase in antibodies associated with an intercurrent infection.

The titre immediately after the pregnancy does not determine the duration of demonstrable antibodies. One patient with a postpartum anti Rh titre of 1-5,000 showed no antibodies three months later, while another patient with a postpartum titre of 1-120 still is strongly sensitized at fifteen months.

Because of this persistence of Rh antibodies for long periods of time after a pregnancy, it seems advisable to inquire into the obstetrical history of every woman before a transfusion is given. The child born of a strongly sensitized woman should show some evidence of erythroblastosis: prematurity, stillbirth, neonatal death, edema, jaundice, hemorrhage or anemia. When the obstetrical history reveals any such abnormality the Rh status should be determined and studies made to determine whether or not antibodies are still present.

The Reaction

In the test tube the union of Rh antigen and antibody results in agglutination only and in some cases this agglutination is very slight. On the other hand, in case of erythroblastosis, the union of the maternal antibodies with the fetal antigen produces hemolysis, capillary injury and necrosis of cells in the liver and brain. The kidneys of the fetus are not significantly damaged. When antigen and antibody are combined in the circulating blood as occurs when Rh positive blood is transfused into a sensitized individual, there occurs a marked hemolysis of the transfused cells and often oliguria or anuria. The interference with kidney function may be very marked but the nature of the kidney lesion is not clearly understood. It has been customary to attribute the anuria to obstruction of the kidney tubules by hemoglobin. However, in many cases the hemoglobin deposits have been insignificant or absent. Tubular degeneration similar to that caused by bichloride of mercury poisoning has been observed. Necrosis of the entire cortex has been described.[9] Since cellular damage is such

a prominent feature of erythroblastosis, it seems very probable that in transfusion reactions of this type cellular injury to the tubular epithelium is a significant part of the kidney lesions and may be fully as important, if not more so, than tubular obstruction by hemoglobin.

In most of the cases reported in the literature the reactions have been severe or fatal, probably because minor reactions are not reported.[3,4,9,15,16,17,20,22,23,25] In the course of the studies reported here only two serious reactions were observed and both patients recovered. Many cases of serious reactions reported in the literature prior to the time Rh studies were available may have been due to Rh sensitization. Dieckman[7] reported eight severe reactions at the Chicago Lying-in Hospital. Four of them were due to group incompatible blood and all of these four patient survived. In the other four patients the reactions occurred with compatible blood and may have been due to Rh sensitization. All of these four patients died. De Gawin[6] reported 3,500 transfusions with thirteen severe reactions. Six of these occurred in association with pregnancy or after multiple transfusions. In the recent literature many cases have now been reported with complete Rh studies. Hamilton and Martini[20] point out that a fatal reaction to a transfusion may be obscured by, or confused with a deterioration of the patient's condition due to the primary disease. The following case suggests such an occurrence.

Case 11.—A woman near term was admitted for so-called "apoplexy" of the uterus. A cesarean section and hysterectomy was done. She was transfused from the husband. A few hours after the operation she developed jaundice and a high fever and she died about twelve hours later. The patient's condition throughout had been critical.

Comment.—No studies of the blood were made in this case. It is, therefore, impossible to determine whether or not the jaundice, fever and death were due to a transfusion reaction of the Rh type or to a natural deterioration in the patient's conditions.

Management of Transfusions During Pregnancy

Transfusions to women during their pregnancy or puerperium must be governed by the following considerations. The sensitization developed by some Rh negative women may appear early in the first trimester and may persist for many months after the delivery. It may be that during periods of fever and illness these antibodies become more active. The child born of such a sensitized mother usually shows some manifestation of erythroblastosis. However, if the woman is a primipara there is no prior history to suggest that she may be sensitized. Even if a woman has previously given birth to one or more normal children, she may be sensitized during the current pregnancy. In one case studied the woman had given birth to five normal children. The sixth pregnancy resulted in a stillborn, erythroblastotic baby. She was Rh negative and her serum contained anti-Rh agglutinins. Sometimes the erythroblastosis in the child may masquerade as a death due to prematurity, eclampsia, anoxemia or other causes even after an autopsy study. Often the erythroblastotic baby may appear quite normal at birth or for several days. It is, therefore, almost impossible for the physician to be completely certain that a woman is not Rh negative and sensitized.

Except in extreme emergencies no woman who is pregnant, or recently delivered, should be given whole blood until her Rh status has been determined. In almost all emergencies plasma or serum can be given until the Rh tests can be prepared. This applies even in cases of early abortions but probably not in the usual ectopic pregnancy.

If the woman is proven to be Rh positive, transfusions of any group compatible blood can be given and the question of Rh sensitization can be dismissed. If the woman is Rh negative and if the baby has died or is abnormal in any way, the possibility of erythroblastosis is very great and it is almost imperative that Rh negative donors be used. If, however, the mother is Rh negative and the child is not yet born, or is normal, a troublesome situation is present. Such a woman may not be sensitized.

The serum can be studied for the presence of Rh antibodies and if any are demonstrated only Rh negative donors can be used. If no agglutinins are demonstrable, there still exists the good possibility that this particular individual has weak or absent agglutinins but does possess hemolysins or cytotoxic antibodies which cannot be demonstrated. It is, therefore, safer to use Rh negative donors for all Rh negative women during pregnancy in all circumstances if such donors are available.

Sometimes no Rh negative donors can be found. In such cases the biologic test proposed by Wiener, Silverman and Aronson[27] may be carried out. This test consists of the intravenous injection of 50 c.c. of the prospective donor's blood with a determination of the icteric index before and one hour after the injection. If no hemolysis occurs as demonstrated by an elevation of the icterus, a second 50 c.c. should be given if time allows. The icterus should be determined one hour after this second injection. If no elevation of the icterus occurs, the remainder of the transfusion can be given. The following two summaries illustrate the use of this test.

Case 12.—The woman was admitted to the hospital during the course of an inevitable abortion at four months of pregnancy. She had had a secondary anemia prior to the pregnancy and had been given a transfusion about one year before. Her blood was group 0 and Rh negative. The prospective donor was the one who had given blood to the patient a year before. His blood was group 0 and Rh positive. There were no other donors and it was desired to transfuse the patient if possible. The Levine cross-matching showed no agglutination. A Wiener biologic test was carried out and was supplemented by hourly temperature readings. The results are summarized in Table IV.

TABLE IV. POSITIVE WIENER BIOLOGIC TEST

Hour	Blood c.c.	Icterus	Temperature
9:00		2	98.6
9:30	50	—	98.6
10:30		6	99.2
11:30	50	—	99.2
12:30		8	100.8
2:30		6	101.2
4:30		—	102.0

Comment.—In this case, even though the Levine cross-matching showed no incompatibility, 50 c.c. of the prospective donor's blood raised the icterus from 2 to 6; 100 c.c. raised the icterus to 8 and induced a fever of 102 degrees. Such a reaction from 100 c.c. of blood indicates that the usual 500 c.c. would have resulted in a severe reaction.

Case 13.—This woman was admitted to the hospital because of toxemia and anemia. A cesarean section was anticipated and the physician desired to give several transfusions. The patient was a group A and Rh negative. The Levine cross-matching with eight different group compatible Rh positive cell suspensions showed no agglutination—*i.e.*, there were no demonstrable antibodies. One Rh negative donor was found and all others were Rh positive. A Wiener biologic test was carried out and the results are given in Table V. Because the test was negative, 500 c.c. of the blood was given. A second transfusion of Rh positive blood was given a few days later. Ultimately a cesarean section was done and living twins were delivered. There was no evidence of erythroblastosis and the mother developed no demonstrable Rh agglutinins during her hospital stay.

TABLE V. NEGATIVE WIENER BIOLOGIC TEST

Time	Blood c.c.	Icterus	Temperature
10:00		2	98.6
10:30	50		98.6
11:30		2	98.6
12:00	50		98.6
1:00		2	98.6
3:00	400		98.6
4:00		2	102.0*

*Pyrogen reaction.

This test proposed by Wiener, Silverman and Aronson seems very useful and probably will allow the physician to transfuse some patients who otherwise would have to be treated by other less efficient means. The test is new, and more experience with its use is necessary.

The persistence of Rh antibodies for months or years after a pregnancy presents another problem. Such sensitized women would suffer a reaction if, because of anemia, shock or blood loss, a transfusion of Rh positive blood should be given. If there is any history suggesting erythroblastosis in the babies, the Rh status should be determined. If the woman is Rh negative, tests for antibodies or a Wiener biologic test should be done before the transfusion is given. Better still, Rh negative donors should be used if they are available.

Management of Multiple Transfusions

The planning of a program for a patient who is to receive several transfusions is greatly simplified if the Rh grouping is known. If the patient is Rh positive the entire question of sen-

sitization can be dismissed. If, however, the patient is Rh negative, sensitization may develop and consideration must be given to this possibility. It has been shown that there is a period after the first transfusion before antibodies appear. The duration of this latent period is not known for any one patient but it may be as short as five days.

In the majority of patients it is usually quite evident whether a single transfusion or several transfusions will be necessary. In many of the cases where multiple transfusions will be used it would be just as efficient to give all the blood within a period of five or six days. In other words, in many patients the entire transfusion program can be crowded into the first few days of hospitalization and the possibility of sensitization can be avoided.

Case 14.—This patient while in the hospital developed a massive hemorrhage from a duodenal ulcer. The hemoglobin dropped to 6.3 grams. The patient was a group A and was Rh negative. Several transfusions could be anticipated and it was the intention to do a gastric resection whenever the patient's condition permitted. Many donors were available but only two were Rh negative. During the next six days the patient was given 3,000 c.c. of blood and a gastric resection was done on the sixth day. There were no reactions and the patient's postoperative course was excellent. No more transfusions were necessary. 2,500 c.c. of the blood was Rh positive and 500 c.c. was Rh negative. One Rh negative donor was held in reserve to be used if necessary during the period when sensitization could be expected.

Comment.—In this case the need for many transfusions was obvious. Knowing that the patient was Rh negative and might develop reactions after the first five or six days, the transfusions were crowded into the first few days and the operation was done on the sixth day. An Rh negative donor was held in reserve to be used if necessary during the period of possible sensitization. This patient developed traces of antibodies on the twenty-eighth day after the first transfusion.

Case 15.—This patient had shock and anemia from a ruptured ectopic pregnancy. She was a group 0 and Rh negative. All available donors were Rh positive and all were compatible by the Levine cross-matching. Sensitization occurring during the course of the ectopic pregnancy was dismissed as improbable. On the day of surgery she was given one transfusion of 550 c.c. of Rh positive blood without reaction. On the following day her condition was satisfactory but since she had lost considerable blood, she was given two more transfusions of Rh positive blood—both without reaction.

Comment.—The transfusions on the day after operation were not imperative. It was felt that her convalescence would be hastened by replacing the blood lost. Because she was an Rh negative individual, all the desired transfusions were given promptly before sensitization could develop. On the ninth day this patient developed antibodies against Rh positive cells.

In some cases it is neither desirable or permissible to crowd the transfusions into a short period of time. In others the blood loss is continuous and transfusions over a long period are necessary (Case 8). Most blood dyscrasias require transfusions over a long period.

Case 16.—This woman was admitted to the hospital because of fever and weakness. A diagnosis of ulcerative endocarditis due to S. viridans was established. This patient was a group B and Rh negative. Multiple small transfusions were given. All the donors were Rh positive. The results of these transfusions are summarized in Table VI.

TABLE VI

Date	Blood c.c.	Days Since First Transfusion	Days Since Last Transfusion	Reaction
1/11/43	200	0	0	0
1/11/43	250	0	0	0
1/20/43	300	9	9	0
1/25/43	300	14	5	0
2/ 2/43	500	22	8	0
2/11/43	200	31	9	0
2/12/43	200	32	1	Chill
2/15/43	300	35	3	Severe chill

Rh antibodies demonstrable four days after last transfusion.

In Case 16 the transfusions were given at relatively short intervals. The reactions, when they developed, were of moderate degree. The second was more severe than the first. Experience with other similar situations suggests that if the transfusions are spaced close together the abrupt occurrence of a severe reaction may be prevented.

When antigen is introduced into a sensitized individual, it unites with the antibody and for

some time thereafter no antibody is demonstrable.[2] This absence of antibodies immediately after a transfusion of Rh positive blood has been called a "negative phase" by Wiener.[23,27] The antibodies reappear within three to five days. Theoretically it should be possible to completely prevent reactions in Rh sensitized individuals by giving transfusions at two- to four-day intervals and the use of closely spaced transfusions has been suggested as a means of preventing reactions.[23,28,29] That this is not true is illustrated in Case 16 and also Case 8. However, the reactions which developed in these two cases were not severe.

When transfusions to Rh negative patients must be given over a long period of time, it appears that the transfusions should be spaced at relatively short intervals. It appears probable that if the transfusions are given close together, the reactions, when they develop, will be mild and will serve as a warning to discontinue the use of Rh positive blood. Cases reported in the literature and Case 1 cited here indicate that if there are intervals of weeks or months between transfusions, the first reaction may be severe.

There sometimes occur situations wherein it is not possible to foresee the need for further transfusions. A patient may be given one transfusion and after an interval of several days the condition is such that another transfusion is desirable. In this case the laboratory workers are placed in a very difficult situation. It is often impossible to determine the patient's Rh grouping at this time. The blood cells from a compatible donor persist in the recipient's circulation for three to four months.[15] If an Rh negative patient is given Rh positive blood, these positive cells persist in that patient's circulation. If this mixture of bloods is tested with the Rh antiserum, the donor's positive cells will be agglutinated and the technician may erroneously conclude that the patient is Rh positive. Wiener's differential blood grouping[15] does not help in these cases. It is impossible to distinguish between a weakly reacting Rh positive individual and an Rh negative patient who has received Rh positive blood. Physicians are urged to request an Rh grouping before the first transfusion whenever there is any possibility of more transfusions later. Technicians can also make it a practice to preserve, in the refrigerator, the original blood sample as clotted blood so that they may go back to it to determine the Rh grouping at a later time.

If in these cases the patient's Rh grouping cannot be established the physician may give a small trial transfusion or the Wiener biologic test transfusion can be done.

Transfusions to Erythroblastotic Babies

Transfusions to infants differ in no essential manner from those to adults. In the case of the baby with erythroblastosis, certain features complicate the situation. These babies have been exposed to maternal Rh antibodies which have become fixed to the child's tissues. Transfusion of the mother's blood adds more antibody to the infant and aggravates the child's condition. In two cases referred for study the mother's blood was used and in both instances the child died.

Levine stated that Rh negative blood should be used for transfusing erythroblastotic babies. This is impractical in many cases. The delay necessitated by a search for negative donors will, in many cases, result in the death of the infant. Experience has shown that the use of any group compatible blood other than the mother's is suitable. Theoretically, Rh positive blood will help in destroying the maternal antibody fixed to the infant's tissues. The entire question of which Rh type of blood to use for erythroblastotic babies needs more study. However, in the meantime, the condition of the child should never be endangered by delays attending a search for Rh negative donors. The majority of erythroblastotic babies have been treated with Rh positive blood with excellent results.

In many cases a diagnosis of erythroblastosis is possible before the child is born and it is advantageous to have blood available for transfusion immediately after birth. In such cases blood can be drawn from a group 0 donor beforehand and stored in the refrigerator—to be kept ready for use. The blood group of the offspring cannot be forecast unless both parents are group 0. Even when both parents are group A the offspring may be group 0 and the blood of the father may be incompatible. Therefore, only group 0 blood can be used without cross-matching.

Summary

The Rh substance is, in general, similar to the A and B substances which determine the division into the four blood groups. Rh positive indi-

viduals cannot become sensitized. Rh negative individuals, if inoculated by transfusion—or during pregnancy from the fetus—may develop antibodies. The Rh substance varies greatly in its antigenic property: some people become sensitized very readily, while others either form no antibodies or do so only to a slight degree. The antibody which can be demonstrated in the laboratory is the agglutinin. Apparently other types of antibodies are formed which are not detected by laboratory tests but will produce transfusion reactions or erythroblastosis in the fetus. The absence of demonstrable agglutinins, therefore, does not exclude the presence of other dangerous antibodies.

In pregnancy the antibodies may develop between the eighth and twelfth weeks so that transfusions after early abortions must be handled in the same way as those later in pregnancy. The antibodies may persist for many months after delivery and in exceptional cases have been observed at two and six years after the last pregnancy. An investigation of the obstetrical history of women should be made prior to a transfusion and, if any evidence of erythroblastosis in the babies is present, the possibility of sensitization should not be overlooked.

Except under rare circumstances whole blood should never be given to pregnant or puerpural women until their Rh grouping is known. If they are Rh negative, only Rh negative donors should be used. In case where no evidence of sensitization can be demonstrated, Rh positive blood can be given if the Wiener biologic test is negative.

If multiple transfusions are to be given a knowledge of the Rh grouping is very helpful. If Rh positive, the transfusion program can be carried out with no worry relative to Rh sensitization. If the patient happens to be Rh negative, an attempt may be made to complete the transfusion program within the five- or six-day period before antibodies can develop. If this is not practical, the transfusions should be spaced close together—for example, at two- to four-day intervals. The evidence indicates that if transfusions are spaced close together, the reaction—when it develops—will be of a mild degree. After reactions develop, the transfusion program can be continued but only by using Rh negative donors.

In transfusing erythroblastotic babies the mother's blood should not be used. There may be a question as to whether or not Rh negative donors are preferable but under no circumstances should the child's condition be allowed to deteriorate because of a delay attending a search for Rh negative donors.

References

1. Aubert, E. F.; Boorman, K. E., and Dodd, B. E.: The agglutinin-inhibiting substance in human serum. J. Path. & Bact., 54:89-104, (Jan.) 1942.
2. Boyd, W. C.: Fundamentals of Immunology. New York: Interscience Publishers, 1943.
3. Burnham, L.: The common etiology of erythroblastosis and transfusion accidents in pregnancy. Am. J. Obst. & Gynec., 42:389-397, (Sept.) 1941.
4. Crooks, P. E.: Blood transfusion reaction due to intragroup incompatibility. Am. J. Obst. & Gynec., 44:121-123, (July) 1942.
5. Davidsohn, I., and Toharsky, B.: The Rh blood factor; an antigenic analysis. Am. J. Clin. Path., 12:434-441, (Aug.) 1942.
6. DeGowin, E. L.: Grave sequelæ of blood transfusions; clinical study of thirteen cases occurring in 3,500 blood transfusions. Ann. Int. Med., 11:1777-1791, (April) 1938.
7. Dieckman, W. J., and Kramer, S.: The treatment of oliguria and anuria. Am. J. Obst. & Gynec., 40:61-69, (July) 1940.
8. Fisk, R. T., and Foord, A. G.: Observations on the Rh agglutinogen of human blood. Am. J. Clin. Path., 12:545-552, (Nov.) 1942.
9. Hamilton, E. G., and Martini, A. P.: Blood transfusions in pregnancy; a review of 3,000 cases. Am. J. Obst. & Gynec., 43:313-325, (Feb.) 1942.
10. Henderson, J.: The present status of certain blood substitutes, Collective review. Surg., Gynec. & Obst., 76:1-11, (Jan.) 1943. (Abstract section.)
11. Javert, C. T.: Further studies on erythroblastosis neonatorum of obstetrical significance. Am. J. Obst. & Gynec., 43:921-940, (June) 1942.
12. Landsteiner, K., and Levine, P.: On individual differences in human blood. J. Exper. Med., 47:757-775, 1928.
13. Landsteiner, K., and Wiener, A. S.: Studies on an agglutinogen (Rh) in human blood reacting with anti-rhesus sera and with human isoantibodies. J. Exper. Med., 74:309-320, (Oct.) 1941.
14. Levine, P., and Katzin, E. M.: Pathogenesis of erythroblastosis fetalis: Absence of Rh factor from saliva. Proc. Soc. Exper. Biol. & Med., 48:126-129, (Oct.) 1941.
15. Levine, P., and Polayes, S. H.: Atypical hemolysins in pregnancy. Ann. Int. Med., 14:1903-1908, 1941.
16. Levine, P.; Burnham, L.; Ketzin, E. M., and Vogel, P.: The role of iso-immunization in the pathogenesis of erythroblastosis fetalis. Am. J. Obst. & Gynec., 42:925-937, (Dec.) 1941.
17. Levine, P.; Katzin, E. M., and Burnham, L.: Atypical warm isoagglutinins. Proc. Soc. Exper. Biol. & Med., 45: 346-348, (Oct.) 1940.
18. Levine, P.; Vogel, P.; Katzin, E. M., and Burnham, L.: Pathogenesis of erythroblastosis fetalis. Science, 94:371-372, (Oct. 17), 1941.
19. Mollison, P. L., and Young, I. M.: Isoagglutinin changes after transfusion of incompatible blood and serum. Lancet, 2:635-638, (Nov. 22), 1941.
20. Peters, H. R.: Anuria, following hemolytic reactions to blood transfusion; recovery following splanchnic block. Ann. Int. Med., 16:547-556, (March) 1942.
21. Potter, Edith L.; Davidsohn, I., and Crunden, A. B.: The importance of the Rh blood factor in erythroblastosis. Am. J. Obst. & Gynec., 45:254-261, (Feb.) 1943.
22. Scott, J. E., and Conant, J. S.: Successful transfusions following a previously hemolytic transfusion reaction due to the Rh and anti-Rh factors. Am. J. Clin. Path., 11:536-541, (June) 1941.
23. Wiener, A. S.: Hemolytic reactions following transfusions of blood of the homologous group. Arch. Path. 32:227-250, (Aug.) 1941.
24. Wiener, A. S.: Hemolytic transfusion reactions. 1. Diagnosis, with special reference to the method of differential agglutination. Am. J. Clin. Path., 12:189-199, (April) 1942.
25. Wiener, A. S., and Forer, S.: Human serum containing four distinct isoagglutinins. Proc. Soc. Exper. Biol. & Med., 47:215-218, 1941.
26. Wiener, A. S.; Oremland, B. H.; Hyman, M. A., and Samwick, A. A.: Transfusion reactions; experiences with more than 3,000 blood transfusions. Am. J. Clin. Path., 11:102-122, (Feb.) 1941.
27. Wiener, A. S.; Silverman, L. J., and Aronson, W.: Hemolytic transfusion reactions. II. Prevention, with special reference to a new biologic test. Am. J. Clin. Path., 12:241-248, (May) 1942.
28. Wolfe, J. J., and Das Gupta, C. E.: Acquired immunity to blood transfusion reactions; a new phenomena. Brit. Med. J., 2:807-808, (Dec. 6) 1941.
29. Young, R. E. S.: Allergic reaction following transfusion; apparent desensitization of recipient. Am. J. Surg., 55: 607-610, (March) 1942.

CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL

A. J. Hertzog, M.D., and S. V. Lofsness, M.D.
Pathologists

Presentation of a Case

A-43-1788

Dr. Petit: The case is that of a Mexican, fifty-two years old, who was admitted to the Medical service on August 28, 1943, where he died on September 23, 1943.

On admission he complained of a cough of three to four years' duration. This was usually worse in the winter, but was present the year around. He raised small amounts of mucus, which was occasionally bloodstreaked; he never coughed up any appreciable amount of blood. During the last three months, the cough became more severe; he had attacks of severe coughing many times each day, each of which lasted several minutes, during which he would raise moderate amounts of mucus. He had also noted increasing difficulty in swallowing these last three months; food often seemed to stop in his chest and caused some discomfort. He gradually ate less food and lost 20 pounds in weight during this period. He became short of breath on slight exertion. There was a sensation of numbness in his left arm and hand during some of the coughing spells.

Examination showed a middle-aged Mexican, ambulant, and not acutely ill. His temperature was 98 degrees, pulse rate 70, respiratory rate 20, blood pressure 100/70. The only abnormal findings were in the chest; there was dullness to percussion behind the upper part of the sternum and extending laterally for about 5 cm. between the first and third ribs.

Laboratory studies: Hemoglobin 95 per cent; RBC, 5,120,000; WBC, 5,400 with 82 per cent neutrophiles, 15 per cent lymphocytes and 3 per cent monocytes; urinalysis, negative; Rytz, Kline and Wassermann were positive.

Dr. Stenstrom: The x-rays of his chest taken on admission show a dense mass about 12 cm. in diameter in the superior mediastinum. It is bilateral, but more prominent on the right. A lateral view shows it is anterior, and in contact with the upper portion of the sternum. It could be either a sub-sternal goitre, an aneurism, or a neoplasm.

Dr. Petit: The patient remained ambulant and afebrile for three weeks. He continued to have coughing spells frequently; his cough was harsh and brassy, and usually he raised a little mucoid sputum. The Rytz, Kline and Wassermann tests were repeated a few days after admission and were again positive. Ten sputum samples were examined for tubercle bacilli and all were negative. About two weeks after admission he was given a moderate dose of deep x-ray over the tumor. This was done as a diagnostic procedure, feeling that the tumor would rapidly decrease in size if it was a lymphoblastoma. However, the tumor remained the same size.

Dr. Stenstrom: Further x-ray studies of the tumor were done. The mass displaces the barium-filled esophagus posteriorly very much, and this explains his dysphagia. An over-exposed film shows no evidence of teeth or bones in the tumor, as sometimes seen in teratomas. The arch of the aorta seems to be distinct from the mass. The mass does not pulsate. We were not able to determine whether this mass was a neoplasm or an aneurism.

Dr. Petit: Because the tumor seemed to be distinct from the arch of the aorta, very high in the chest, and non-pulsatile, most of the men who saw this patient felt that it was a neoplasm, and exploratory operation was being considered. However, Dr. Moses Barron thought that it was very probably a round, thrombosed aneurism. On September 21, 1943, his temperature rose to 100.4 and his coughing increased, with periods of dyspnea and cyanosis. He was given morphine and oxygen, and tracheal suction was used. His temperature rose, the dyspnea and cyanosis increased, and he died on September 23, 1943.

Autopsy Findings

Dr. Petit: The body was slim but muscular. The only important findings were in the chest. The heart weighed 330 grams and appeared normal. The mass in the mediastinum was an aneurism, which arose from the superior surface of the arch of the aorta just proximal to the innominate artery. The aneurism was round, 12 cm. in diameter, and communicated with the aorta by an opening only 2x1 cm. The aneurism had a thin fibrous wall, but was completely filled by a laminated thrombus. The root and arch of the aorta showed a white, wrinkled intima, very suggestive of syphilitic aoritis. The lungs were heavy, the right weighing 670 grams and the left 1,000 grams. Both showed marked edema and congestion of the lower and posterior portions, with small patches of consolidation.

Dr. Lofsness: Microscopically, the arch of the aorta shows collections of lymphocytes in the adventitia and

(Continued on Page 1003)

HISTORY OF MEDICINE IN DODGE COUNTY

BY JAMES ECKMAN
Rochester, Minnesota

and

CHARLES E. BIGELOW, M.D.
Dodge Center, Minnesota

(Continued from October issue)

Dr. James (or Jacob) Manning Saunders (1816-1904) was born in Brookfield, New York, on April 11, 1816, the son of August Saunders and Eunice Lewis Saunders.[53] Not much is known about his early years, but it is believed that as a young man he supported himself by teaching school in New York State. He also, at some time, learned the trade of carpentry. On April 3, 1845, he was married to Miss Ellen A. Babcock (1825-1885), a native of New York State. She was a practical nurse of some experience, and later aided her husband considerably in his professional duties in Dodge County. She died of pulmonary tuberculosis in Dodge Center on April 29, 1885.

Dr. and Mrs. Saunders moved to Hamilton, New York, after their marriage in 1845, and in about 1850 or 1851 went to Milton, Wisconsin, which was a center for Seventh-Day Adventists, of which both the physician and his wife were members. There he worked at his trade of carpentry, and he may also have practiced medicine to some extent. In October of 1870 Dr. and Mrs. Saunders came to Dodge Center, which at the time contained and still contains a considerable number of Seventh-Day Adventists. They remained in Dodge Center for the rest of their lives. In 1871, at the age of fifty-five years, Doctor Saunders received the degree of Doctor of Medicine from the Hahnemann Medical College and Hospital of Chicago.[53] In the same year he became a charter member of the old Southern Minnesota Homeopathic Medical Society, and he was also elected to membership in the Minnesota State Homeopathic Institute.[53] He was elected second vice president of the institute in 1877, and first vice president in 1879.[53] His professional card, as printed in the *Dodge County Republican* of October 10, 1873, was as follows:

J. M. Saunders, M. D.
Homeopathic Physician
Pulls teeth without pain. Fills family cases.
Specialist in obstetrics and children's diseases.

Doctor Saunders was licensed to practice medicine in Minnesota on December 28, 1883.[53] By that year he had more than fulfilled the requirements for licensure by exemption of the medical practice act of 1883.[95] He registered his certificate in Dodge County (as required by law) under the name of "Jacob M. Saunders," but several persons who knew him have said that he never was known by any name other than "James M. Saunders." Possibly he anglicized the German "Jacob" to "James" for professional reasons. It has been said

that he was never referred to by anyone, including his wife, by any name other than "Doctor Saunders."

Ellis,[240] who knew Doctor Saunders personally, reported that before his wife died in 1885, the physician mingled freely with the people of Dodge Center; but that in later years he became almost a recluse, seeing no one but his patients and rarely venturing from his home in Dodge Center. Most of those who remember him have said that he was a dentist, rather than a physician, but without doubt he practiced medicine frequently. Doctor Saunders' health deteriorated rapidly after 1900, and he died on the farm of his daughter in Ashland Township in Dodge County on January 14, 1904, after a paralytic stroke.[241] He was buried at Milton, Wisconsin.[53]

Dr. Christopher Porter Gibson (1848-1933) was born in Ayer Township, Dominion of Canada, on October 26, 1848, the son of William John Gibson and Martha Stockman Gibson. Both his parents were Scotch-Irish, and both had been born in Ireland.[242] When he was about six years old, Doctor Gibson was brought to Dodge County by his parents, who had acquired a farm in the vicinity of Claremont. Doctor Gibson's daughter[242] said that as a small boy her father had run away from home to try to enlist in the Union forces during the War of the Rebellion, but that he was too small and too young to be accepted. He did, however, ride about Dodge County on horseback, carrying messages from the front to various residents in the county as they were received in the telegraph office. The boy was educated partly at the old seminary at Wasioja, and partly at the Owatonna High School. On November 15, 1871, while he was studying medicine on his father's farm, he was married to Miss Ione Ingalls, of Dodge Center. He and his wife returned to the farm, where he did farm work and studied medicine. On September 24, 1872, Dr. and Mrs. Gibson went to Chicago, where the young man enrolled at the Chicago Medical College, from which he was graduated in 1873. He then settled in Dodge Center, the home of his father-in-law, where, as previously mentioned, he became the partner of Dr. James A. Garver (1814-1901). In 1882 he helped draft the constitution and fee bill of the Dodge County Medical Society,[184] and in the same year, his daughter[242] reported, Doctor Gibson moved to Fairpoint in Goodhue County, but by the fall of that year he was in Concord. He was licensed to practice medicine in Minnesota on April 19, 1884, receiving License No. 878.[40] Doctor Gibson bought a house in Concord in 1884,[243] became superintendent of the Sunday school and deacon of the Christian Church in that town, and began to develop his interest in ornithology and taxidermy, which were his avocations throughout his life.

In September of 1888, it was noted,[244] Doctor Gibson made a trip to Colorado, but he was back in Concord before the end of the month.[245] It was believed that he could not endure the rarefied atmosphere of Colorado, and he never applied for licensure in that state.[246] It was evident, at any rate, that he had determined to leave Concord, for he soon sold his house in that village and moved to Dodge Center.[242] On April 4, 1889, he settled in Redwood Falls in Redwood County, where he was to practice medicine for twenty-three years. In Redwood Falls his practice extended for a radius of thirty miles of the town, and he was a highly successful physician. The demands on his strength, however, were so severe that his heart was affected by the strain. In 1912 his health had deteriorated sufficiently for him to seek rest, and after repeated serious episodes of cardiac distress he retired from the practice of medicine and bought a 380-acre farm some six miles north of Milaca in Mille Lacs County, to which he

removed.[242] There he began the breeding of fine livestock and also indulged his fondness for growing flowers of all kinds. When the United States entered the first World War, however, Doctor Gibson interrupted his tranquil retirement by joining the Medical Reserve Corps of the United States Army at the age of sixty-nine years. He became first a lieutenant and then a captain, and served at Fort Benjamin Harrison. In about 1923 Dr. and Mrs. Gibson moved to California, but in 1926 they returned to Minnesota to live in Minneapolis, where they occupied a residence at 2002 Fifth Avenue South.[40] After they had become more and more enfeebled, they decided to register at the Masonic home at Bloomington, Minnesota, which they did in 1932. Doctor Gibson died there of pneumonia and arteriosclerosis on March 20, 1933, at the age of eighty-four years.[247,248] At his death it was said[248] that he was one of the oldest members of the American Legion in the United States. His daughter[242] reported that so far as she could remember, her father never lost his temper on any occasion, and he was known to be one of the most highly regarded citizens in Redwood Falls and the county. His lifetime collection of stuffed and mounted birds, said to be one of the finest in the state, now reposes in the Redwood Falls High School.[242]

Dr. Horace P. Porter (1838-1912) of Claremont was one of the most restlessly energetic physicians who ever settled in Dodge County. Records of the Bureau of Vital Statistics of the Missouri State Board of Health,[249] in which state Doctor Porter died, indicate that he was born at Ellington, Connecticut, for which a township in Dodge County was named,[17] on February 6, 1838, the son of Philo Porter and Clarissa Skinner Porter. On his father's side Doctor Porter's ancestry extended back to the Seventeenth Century in America. Details of his early years are not known, but he was graduated from the Medical Institution of Yale College in 1861, and on September 17, 1861, became assistant surgeon of the Seventh Connecticut Regiment of Volunteers, a post which he occupied until March 19, 1864.[204] At the latter date he resigned so that he could accept the commission of surgeon to the Tenth Connecticut Regiment of Volunteers, which he did on May 1, 1864. He remained with this regiment until November 5, 1864. From November 14 to December 14, 1864, and from October 20, 1866, to August 22, 1867, he was an acting assistant surgeon under contract in the Regular Army of the United States.[204] In 1868 Doctor Porter was in Kalamazoo, Michigan, where on February 11, 1868, he helped to found the old Kalamazoo Medical Association.[250] In 1873, as previously recorded,[55] he appeared in Kasson, Minnesota, to which his younger brother, William E. Porter, had gone in 1865. There Doctor Porter investigated the possibilities of locating in some town along the road of the Winona and Saint Peter Railway Company, but he remained in Kasson for about one year. In September of 1874 he moved to Claremont,[56] where in addition to engaging in the practice of medicine, he sold blank deeds, mortgages and leases, and acted as the subscription agent for the *New York Tribune*.[59] In December of 1874 he began to publish one of the most curious frontier newspapers in the history of the state. This was *The Wind Mill* of Claremont, the first newspaper that village ever had. Excerpts from this odd four-page sheet have been printed herein previously, but a few more will be reproduced to show the ready wit and inventiveness of their author. The little publication had been in existence for about a year when Doctor Porter decided to suspend it for a while. He wrote:[59]

GOOD NIGHT, FRIENDS

This issue of our paper will be the last we shall publish this season. We announced that we should issue when "we feel like it," consequently we are under no obligations to appear regularly, as is the case with the older and more fully developed papers. We are going to hibernate during the winter that is now upon us; in short, we shall sleep the sleep of a just newspaper made perfect. In the spring, when the snows are melted from the ground, and the green grass appears, and the birds come back from the sunny south, we shall again come before our friends fresh from a restful and unconscious slumber, prepared to grapple and struggle mightily with a discriminating environment of numberless readers. Remember, friends, that THE WIND MILL is not dead, but is merely reposing in the arms of *"somnus,"* renewing its strength for the future time of need, the good time coming, when you will conclude to liberally sustain a weekly paper printed in Claremont.

In an "extra" edition of *The Wind Mill,*[251] issued in May of 1876, he exhorted his fellow townspeople of Claremont thus:

SOLEMNITIES

It will pay in the long run to patronize your own town. The west "slice" of Dodge county belongs to Claremont, and we *will* have it, with a big "chunk" from the eastern part of Steele. Geography don't lie, and the people are beginning to see it. Two years ago the jackals howled in the streets, and now we are securing a lively trade. . . . Now in Claremont the epidermis of things is a little tough, but the business interior, the vital organs of trade, are in a healthy condition. If you doubt it, bring in your country produce and give us a trial.

"You can buy anything from a first-class ocean steamship to a sperm whale in Claremont," he boasted in the same issue.[251] In another edition of *The Wind Mill*[60] he announced that: "Doctor Porter extracts teeth. Call and see him, and get rid of that old 'grinder' that has been keeping you awake for a week," and he took notice of his past business as well: "Please call and pay Doctor Porter that little bill which is now overdue."[60] He observed that "THE WIND MILL is the best printed paper in Dodge County. The typographical excellence of this paper has been the admiration of good judges of such matters,"[60] and said, possibly with his tongue in his cheek, that "The WIND MILL never resorts to vile personal abuse. The editor prefers to save up his venom for a special tract, which he will issue at some future time."[60]

In December of 1880 Doctor Porter inaugurated another publication, called *The Cosmopolitan,* but this organ did not long endure.

In March of 1882 it was announced[113] that Doctor Porter was selling his chattels at auction. Soon thereafter he went to Corning, Missouri; but in November of 1882 he was back in Dodge County, visiting his brother, William E. Porter, of Kasson. It was suggested[114] at the time that Doctor Porter might remain in the county, but he did not do so. In February of 1883 he removed from Corning, Missouri, to Shubert, Nebraska, in Richardson County.[115] It was said[252] that he was licensed to practice medicine in this county. But Doctor Porter did not remain long at Shubert; in September of 1884 he returned to Kasson to visit his brother.[121] In October he decided to relocate in Claremont,[122] where he became manager of the Cleveland House, laid in a small supply of drugs which he kept for sale, and issued another publication called *The Q,* which appears to have been decidedly ephemeral. He was hardly well settled in Claremont when he determined to leave Dodge County once again. In April of 1886, as previously set forth, he traded his stock of drugs to Dr. Charles Willmar Coleman (1855-1925) for Kansas land,[124] and in May left for Kansas.[125] He was not, however, licensed to practice medicine in Kansas, so far as avail-

able records indicate.[126] In October of 1886 it was said that Doctor Porter was living in Du Bois, Nebraska,[134] and on February 4, 1889, he was licensed to practice medicine in Missouri,[76] receiving License No. 4050. He was licensed to practice medicine in Jefferson County, Texas, on January 30, 1903, and to practice medicine in the state of Texas on February 18, 1908.[253] In the latter year he was living in Port Arthur, Texas. He died at Butler, Missouri, on December 23, 1912, and at his death it was said that at one time he had served as surgeon general of the Grand Army of the Republic.[254]

Dr. Nils Schultz Holterman (1845-1895) was born in Trondhjem, Norway, on May 29, 1845, the son of Michael Holterman and Nicoline Holterman. The father was pastor of the second largest Lutheran church in the city of Trondhjem. The son, Nils, was one of five boys born to his parents: one of the sons (Christian) became a major general in the army of Norway; one (Lisco) became a sea captain; two (Marcus Frederick and Peter) died at the age of eighteen; and Nils became a physician.

The young man was educated in the public schools in Norway, and was subsequently graduated from what is now the Kongslige Fredriks Universitet Medisinske Fakultet at Oslo. During vacation periods he served as a medical attendant at a health resort in Germany, and in the course of his education he learned to speak German, English, French, Greek and Hebrew, in addition to Norwegian.

On July 28, 1868, Doctor Holterman was married to Miss Marie Krog of Copenhagen. Soon thereafter he immigrated to the United States with his wife. He planned to locate in Chicago, and in fact arrived in that city just before the great conflagration of 1871. Most of his possessions were lost in the disaster, and he himself served as a picket to protect the property of others from looters.

Next, Doctor Holterman moved to Saint Louis, where he attended the old Missouri Medical College, which in 1899 was absorbed by the present Washington University School of Medicine. In about 1874 he moved to Kasson in Dodge County, where he practiced medicine for four years.

In 1878 Doctor Holterman removed to Glenwood in Pope County. This was his home until his death, but for some years he had an office in Starbuck, at the western end of Lake Minnewaska, and he also traveled as far as Donnelly in Stevens County, on professional calls. He was licensed to practice medicine in Minnesota on December 31, 1883, receiving License No. 596.[40] From 1881 to 1883 he was coroner of Pope County. In June of 1892 he relinquished his office in Starbuck to Dr. Ole E. Linjer (1869-1907), who served as city physician of Minneapolis in 1906 and 1907.

Doctor Holterman died in Alexandria, Minnesota, on July 17, 1895. He was remembered as an intrepid physician who would travel as far as forty miles by skis to reach his patients, and as a self-effacing professional man who often would make sure that his patients received every kind of drug or medicine necessary, even though he might know that he would never be paid for either his services or his drugs.

(To be continued in the December issue)

References will appear at the conclusion of this article.

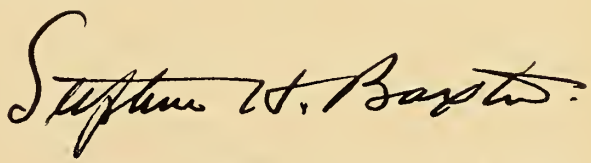
President's Letter

LOOKING INTO THE FUTURE

"The mind is so intimately dependent upon the condition and relations of the organs of the body, that if any means can ever be found to render men wiser or more ingenious than hitherto, I believe that it is in Medicine that they must be sought for. It is true that the science of Medicine, as it now exists, contains few things whose utility is very remarkable; but without any wish to depreciate it, I am confident that there is no one, even among those whose profession it is, who does not admit that all at present known in it is almost nothing in comparison with what remains to be discovered; and that we could free ourselves from an infinity of maladies of body as well as mind, and perhaps, also, even from the debility of age, if we had sufficiently ample knowledge of their causes, and of all the remedies provided for us by Nature."

Thus wrote Descartes in 1637. The statement that "Medicine, as it now exists, contains few things whose utility is very remarkable" could, without arrogance or undue self-conceit, be disputed today, but, with that exception, the quotation is as pertinent as the day it was written. If we are able at all to profit by the lessons of history and past experience, we must necessarily hold that opinion. Imagine the embarrassment, if he were living now, of the Commissioner of Patents who wrote, two hundred years after Descartes, and a hundred years ago, "We see the arrival of that period when human improvement is at an end"! The past fifty years have seen greater advances in medical sciences than were experienced in all the preceding history of the human race, but to think that the limit had been reached would show an entire lack of imagination. Cancer is no more mysterious to us than was tuberculosis before the time of Koch. Diphtheria was no more baffling before the discovery of Loeffler, than is rheumatic fever to us today. Who would have the temerity to say that the secrets of cancer and rheumatic fever will never be revealed? Within the memory of many of us, the practice of medicine and surgery has been revolutionized and, doubtless, researches in the field of chemistry and physiology will bring about equally radical changes in the future.

When men can learn the secret of living together in peace and can utilize the discoveries of science to promote human welfare and happiness, then medical science, also, will be able to concentrate all its talent and resources to the pursuit of the knowledge necessary for materializing the prophetic vision of Descartes. In the meantime, in spite of the interruptions and dislocations caused by war, medical men, whether on the battlefronts or in the laboratories, pursue their work of repair and restoration and of saving of life. Medical sciences alone, of all the sciences, are not diverted to purposes of destruction of life and property, but are devoted solely to the discovery and improvement of the means of combating disease, of saving life and of repairing the injuries caused by war.



President, Minnesota State Medical Association

Editorial

Carl B. Drake, M.D., *Editor;* George Earl, M.D., Henry L. Ulrich, M.D., *Associate Editors*

WILL CONGRESS SWELL THE RANKS OF BUREAUCRACY?

THE Wagner-Murray Bill (S.1161) was introduced in the Senate on June 3, 1943. As every physician knows, this bill provides for a six per cent tax on employes earning up to $3,000 a year and a six per cent tax on employers for every employe earning up to $3,000 a year, a seven per cent tax on self-employed individuals, and a 3.5 per cent tax for all government employes. Of the twelve billion dollars so raised, a minimum of three billion will be used for the medical care and hospitalization of some 110,000,000 of the people in the country under the direction of the Surgeon General of the Public Health Service.

The people through their representatives in Congress will be asked to choose whether to take the practice of medicine out of the hands of the profession and place it in the hands of a bureau in Washington or not. If such a change will result in better medical care of the people of this country, will result in a lower mortality, will reduce the cost of medical care, and will stimulate initiative on the part of practitioners, the bill should be passed. We believe that its passage will do no one of these things.

Statistics of the U.S.P.H. Service show that in 1942, the death rate in this country was the lowest on record (10.3 per thousand). Figures given out by the Metropolitan Life Insurance Company on its experience with its millions of subscribers which always closely parallel those of the country at large, show an astounding reduction during the past twenty-five years from typhoid, diphtheria, scarlet fever, influenza, pneumonia, and tuberculosis, and a marked reduction even from cardiovascular disease, appendicitis, and puerperal conditions. Does this indicate the need for a radical change in the method of dispensing medical care in this country?

Bureaucracy is a very grave menace in our country today. For instance in Ohio, there are 90,000 federal employes to 25,000 state; Massachusetts 129,000 federal to 21,000 state; Pennsylvania 215,000 federal to 44,500 state; Wyoming 6,200 federal to 1,100 state. Federal employes at present outnumber all state, county, and municipal employes in the country, and 55 per cent of these federal employes are not directly employed in the war effort. If the Wagner-Murray Bill is passed, the cost of a greatly expanded bureau will be added to the actual cost of the medical care dispensed. And each additional employe of the U.S.P.H. Service will be added to the present 3,000,000 civilian employes of the federal government (exclusive of employes of the Army and Navy) who will receive medical care at half rate and whose livelihood will depend on continuation of the bureau. The passage of this bill will add great numbers to the already large number of federal employes, and they in conjunction with the almost equal number of state, county, and municipal employes will constitute a political block which, receiving special consideration in respect to medical service, will exert a tremendous power. We seem to be approaching a time when one-half of the people will be paying the other half to simply exert the functions of expanded government.

In an editorial on the Wagner-Murray Bill which appeared in August was appended a list of our Senators and Congressmen. They should now be addressed at Washington. Do not procrastinate.

SULFAMERAZINE

THE frequent occurrence of crystalluria and hematuria in patients treated with sulfadiazine has stimulated the search for a chemotherapeutic agent which might lead to fewer renal complications. Sulfamerazine (2-sulfanilamido-4-methylpyrimidine) has recently been investigated because of its greater solubility in water and urine.[7]

Several reports have been made concerning its use in a wide variety of human infections.[1,2,4,5,6] Sulfamerazine is more rapidly absorbed from the gastro-intestinal tract and is more slowly excreted in the urine than sulfadiazine. Therefore effective blood levels can be maintained with

smaller doses given at longer intervals than with sulfadiazine. Apparently, an initial doze of 4 Gm. followed by 1 Gm. every eight hours is sufficient for all but the most severe infections in adults. Sulfamerazine appears to be fully as effective against infections due to pneumococci, meningococci, streptococci and B. coli. Sulfathiazole continues to be the most effective sulfonamide in staphylococcic infections.

The incidence of crystalluria, hematuria and blockage of the renal tubules, pelves and ureters due to sulfonamide crystals does not appear to be any less with sulfamerazine than with sulfadiazine. The most effective means of prevention of renal complications during sulfonamide therapy continues to be the maintenance of a urine output of at least 1,200 c.c. per day. Considerable evidence has accumulated that the maintenance of an alkaline urine reduces the incidence of crystalluria during therapy with sulfamerazine and sulfadiazine. From 15 to 20 Gm. of sodium bicarbonate per day will keep the urine continuously alkaline.[3]

WENDELL H. HALL, M.D.

References

1. Flippin, H. F.; Gefter, W. I.; Domm, A. H., and Clark, J. H.: Studies on 2-sulfanilamido-4-methyl-pyrimidine (sulfamerazine, sulfamethyldiazine) in man. IV. The treatment of pneumococcic pneumonia. Am. J. M. Sci., 206:216, (Aug.) 1943.
2. Gefter, W. I.; Rose, S. B.; Domm, A. H., and Flippin, H. F.; Studies on 2-sulfanilamido-4-methol-pyrimidine (sulfamerazine, sulfamethyldiazine) in man. III. The treatment of meningococcic meningitis. Am. J. M. Sci., 206:211, (Aug.) 1943.
3. Gilligan, Dorothy R.; Garb, S.; Wheeler, C., and Plummer, Major N.: Adjuvant alkali therapy in prevention of renal complications from sulfadiazine. J.A.M.A., 122:1160, (Aug. 21) 1943.
4. Hageman, P. O.; Harford, C. H.; Sobin, S. S., and Ahrens, R. E.: Sulfamerazine: A clinical study of its pharmacodynamics, therapeutic value and toxicity. J.A.M.A., 123:325, (Oct. 9) 1943.
5. Hall, W. H., and Spink, W. W.: Sulfamerazine. Clinical evaluation in 116 cases. J.A.M.A., 123:132, (Sept. 18) 1943.
6. Lepper, M. H.; Sweet, L. K., and Dowling, H. F.: Treatment of meningococcic infections with sulfadiazine and sulfamerazine (sulfamethyldiazine, monomethylsulfadiazine). J.A.M.A., 123-134, (Sept. 18) 1943.
7. Roblin, R. O.; Williams, J. H.; Winney, P. S., and English, J. P.: Chemotherapy: II. Some sulfanilamido heterocycles. J. Am. Chem. Soc., 62:2002, 1940.

BARBITURATE PRESCRIPTIONS

THE much needed federal law for the control of the dispensing of barbiturates is specific in its stipulations. Only physicians and dentists may prescribe for human consumption barbitol or any of its derivatives or preparations containing these drugs. In the case of refills of such prescriptions, written or verbal authority may be given the pharmacist, and in case of an emergency, an original prescription may be telephoned the pharmacist but must be followed by a prescription.

Pharmacists, as a rule, are willing to coöperate with the medical profession in filling these barbiturate prescriptions. Apparently they have been too willing, and the medical profession has not been coöperative in the sending in of written prescriptions when the barbiturates have been dispensed in presumable emergencies. The druggist is required to keep a separate file of these prescriptions and to make notations on them in ink when they are refilled on verbal order from the physician. These files are inspected periodically by federal agents, who are at present insisting that the laxity cease. The penalty of $1,000 fine or a year in jail or both is not pleasant for the pharmacist to contemplate as a penalty for accommodating his clients and the medical profession.

The barbiturate law is a good one and was passed in order to place the dispensing of these drugs in the control of the medical profession. The least we, as physicians, can do is to cooperate with the pharmacists in carrying out the provisions of the law.

ORDERS FOR INDUSTRIAL NURSES

INASMUCH as numerous requests have been received by the Council on Industrial Health of the AMA for reprints of its report entitled, "Standing Orders for Nurses in Industry," we are publishing the report in this issue under the section on Industrial Health as an aid to physicians in industry and to committees on industrial health in state and county medical societies.

The report is an outline which may be modified by industrial surgeons to meet their requirements.

The industrial nurse is a valuable assistant to the industrial surgeon. While her part in the medical care of employes should in general be restricted to the field in which she is trained, the surgeon can delegate certain duties to an intelligent trained nurse. Especially should she be instructed how to proceed in the carrying out of first aid treatment not only for minor but for major injuries. Most important is the nurses's ability to differentiate between situations which require the physician's attention and those which do not.

It is interesting to note that the Council does not approve the dispensing of vaccines and vitamins in the hope of preventing colds nor the dispensing of cathartics from an industrial medical department.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

BIG BUSINESS POINTS THE WAY

Everyone appreciates the appalling job ahead of industrialists and private employers, big and small, when the wheels of war industries come to a standstill and the men and women are mustered out of the services.

Everyone does not know, perhaps, that business leaders regard the job in the light of a last reprieve, the dragon which they must subdue, like the knights of old, or suffer annihiliation.

Gone is the easy assurance that failure at this job signalizes no more than a cause for regret and not the disappearance of an order and a way of life.

America at the Crossroads

"Looking backward to these times," says James H. McGraw, Jr., publsher of *Business Week*, "future historians are likely to say that here we Americans stood at the crossroads and, consciously or not, made our choice between a system of private enterprise and personal freedom and a system of collectivism and regimentation."

It is significant that business at the crossroads no longer relies upon mere opposition to stem the tide.

The fact is that the first steps toward government regimentation have long since been taken. Since 1932, America has become well accustomed to the idea that government can and will make jobs. After this war the government can and will make jobs again, if necessary, more of them at more levels. In so doing it will seal the fate of private business and individual enterprise. That is, unless private business is capable of providing the jobs. It is that possibility which has set the Committee for Economic Development upon a program of widespread activity.

If businessmen, by planning ahead and working together can get production going full speed ahead without much unemployment or for long—then government will have no excuse for providing the jobs or taking over the industries.

Committee at Work

The situation is seen clearly by astute leaders of big business, Paul G. Hoffman, president of the Studebaker Corporation, for one. Mr. Hoffman is chairman of the Committee for Economic Development which is now at work on the problem.

"All of us agree," Mr. Hoffman said in a recent address, "that the peace will most certainly be lost if—in the postwar period, our free society is supplanted by a regime of regimentation. That can happen if we have too much unemployment for too long after peace comes. It is lack of jobs on a large scale that gives dictators their opportunity . . . If collectivism comes to America it will come by default on the part of good citizens rather than design on the part of revolutionaries."

Lesson for Medicine

There is a lesson for medicine in the attitude and objectives of these qualified representatives of big business.

Medical care in the United States long since passed the point where care of the sick was the exclusive responsibility of the doctor, the patient and the patient's family. It is now definitely recognized that government has a responsibility, also, for its indigent and unfortunate, and for certain types of chronic illness. Pushing that responsibility into the accepted domain of private practice will involve relatively few mental adjustments for the average citizen provided the need can be shown to him. The answer to the problem of medicine, as to the problems of private business, is preparation, now, for the peace. It will not serve either medicine or business to cling to imponderables or cite the records of the

past. If there are gaps in medical service anywhere, if there are injustices or inequalities or scarcities, plans must be shaped now to meet them within the operation of private medicine and in coöperation with official agencies.

There Is Still Time

There are solutions for all such problems without upsetting our plan of medical practice. Since it is quite unlikely that any radical social legislation, including the Wagner-Murray-Dingell bill, will get through Congress this year or next, there is still time—but not very much time—to find those solutions.

Physicians in Minnesota have laid solid foundations for coöperation with government agencies and without sacrifice of medical control over standards of service and conditions of work. The pattern can be extended as needed. But the needs elsewhere must be assessed also and practical measures taken to meet them or the initiative will be forever taken out of the doctor's hands.

THREAT TO FREEDOM

The insurance companies are naturally opposed to the Wagner-Murray-Dingell bill. Nevertheless, certain observations made by Mr. C. O. Pauley, president of the Insurance Economics Society of America have such cogency that they should be considered by all thoughtful persons regardless of their own personal reaction to cradle-to-the-grave protections against the jolts of life.

Excerpts from an address by Mr. Pauley as published in a recent publication of the society are reprinted below for the benefit of physicians who may forget that the threat to medicine is only one phase of the over-all danger to American freedom and progress.

"Let me make it clear at the outset," says Mr. Pauley, "that any views I express with regard to compulsory government insurance are not based upon any unfavorable effect that it might have on my business. If compulsory insurance is a good thing for the American people it would be just as foolish for private insurance to oppose it as it would for employers and labor to oppose labor-saving machines. No one business can or should stand in the way of the welfare of the whole people. . .

Other Obligations

"The nation, like an individual, has just so much money to spend, all of which must come from the labors and enterprise of its people. If we want a social security program of this magnitude more than we want other things, perhaps we can have it. In considering this program, however, we must bear in mind that there are certain other obligations which come first. When this war is over we shall probably have a national debt of 300 billion dollars or more. If we assume the interest on this debt is only 2 per cent and it is amortized over a period of 50 years, it will take 9.5 billion a year in taxes. We must finance the rehabilitation of most of the world after the war, and for a time must feed and clothe millions outside our own borders. Recently there appeared in the newspapers a report of the Investment Bankers' Association in which it was estimated that our own industrial development would require 5 billions a year the first three years after the war. Our people want a constantly improved and extended system of education, we want parks and recreational facilities, we want a great many things which are not productive and in addition we must support the vast number of municipal, state and federal employes and costs of services we hope they will render us.

"Killing the Goose"

"You can take only so much in the way of taxes or contributions from the results of free enterprise without 'killing the goose that lays the golden egg.' Can our free economy, in addition to all the other burdens it must carry, support a compulsory government insurance scheme which will impose a 20 per cent or more tax on our payrolls and take 15 or 20 billions from the earnings of those who work and produce and redistribute it to those who do not work and who are not productive?

"If we embark on a social insurance scheme, the cost of which proves to be too great for our national economy to sustain, just one of two things will happen—either the actual benefits will be reduced by inflation which reduces the purchasing power of the dollar with all its attendant evils, or, as is more probable, the failure of free enterprise to give full employment and to sustain the social security burden will result in a demand that the government take over more and more functions now performed by private enterprise and until we have a completely socialized economy.

Effect on Character

"But the cost will not be entirely economic. . . What will be the effect upon the character and enterprise of a generation which knows that from before its birth in a government hospital until it is laid away in the grave, a benevolent governmental bureau will pay the costs of being born, the costs of its education, will supply its recreational needs, will furnish medical services and hospitalization in illness, provide an income during unemployment and sickness, and a

pension if permanently disabled by illness or by old age? What becomes of the incentive to rise out of the conditions in which the individual is born? Will it not result in the rise of only a few who are born with great inner driving power and ambition while the great mass of our people settle down on a dead level of security such as prevails in most European countries? Is it not possible that we may overreach ourselves in our efforts to give every man complete freedom from want and from fear without any responsibility on his part? It was the desire to achieve freedom from fear and want for themselves and their families which urged men on from our Eastern Coast to settle the wilderness and the prairies and made our nation what it is today. Perhaps the striving for the goal has been and is more important in the life of a nation than the goal itself. . . .

Political Costs

"Compulsory social insurance will also have its political costs. Here again I can only touch on one phase of the subject. During the last quarter of a century the federal government has been increasing its powers and functions at a rapid rate. Out of this has grown a bureaucracy which is increasing at an amazing speed. It is not wholly a product of the present administration, but its growth during the past decade has been tremendously accelerated. I think few of us realize the danger involved in this rapid growth of bureaucracy. It is not confined to Washington, but is spreading all over the country. . . In addition to all of these various governmental bureaus, each vying with the other for an increase in its importance, the amount of money it can spend, and the number of people it can employ, we have more recently developed hundreds of governmental corporations some of which are not even audited by the Treasury or any other governmental department. The American bureaucrat seems to have a peculiar genius for hiring additional employes. The OPA has 2,700 lawyers, for instance. England, which has a price control organization similar to the OPA, has managed to struggle along successfully with just 10 members of the legal profession, but our existing bureaus will be completely overshadowed by a bureau which will be necessary to administer a social security system such as is contained in the Wagner bill. It would necessitate a federal bureau representative in every city, village and hamlet who would go into every city and farm home. I do not need to point out the political implications of such a bureau upon the tender ministrations of which every individual would at one time or another during his lifetime be dependent.

But Bureaucrats Go On Forever

"I have never been much afraid we would lose our liberties to a man on horseback. At worst that would be only a passing phase, dependent upon the life and health of one man. But bureaucrats go on forever. Change of administration may impede their advance for a time but their steady progress to more and bigger and better bureaus and more bureaucrats goes steadily on. If we lose our liberties it will be to millions of federal employes who more and more are regulating our individual lives and curtailing our individual freedom.

"You may say, as they told me down in Washington at the Social Security Board, 'You don't want the Government to do anything.' I do want the Government to do everything that cannot be done by private enterprise or that it can do better than private enterprise and which will not impede or destroy private enterprise. Impelled by the economic and political pressure of the early 1930's we embarked upon a system of compulsory government insurance limited to old age annuities, benefits for surviving widows and children and unemployment compensation. These have operated only during the period of increasing employment. They have not existed long enough to prove themselves before venturing upon the much more difficult and costly fields of disability, medical care and hospitalization. I believe in social security, but I want to see it achieved by the efforts of the individual, as far as possible by his own initiative. I believe the government has a great place in such a program. Any system of social security, private or public, is based upon nearly complete employment. And the government should bend every effort to prevent periods of mass unemployment in private enterprise and to make possible at all times profitable employment in private enterprise for all but a small proportion of unemployables. We have made only a small beginning in conservation of health and the prevention of preventable diseases. The expenditures of the government for health conservation and the elimination of communicable and other preventable diseases should be greatly expanded. The governmental efforts should be directed primarily at causes of unemployment, accidents and disease and to the rehabilitation of those who have become impaired. In my opinion, the efforts of government should be addressed primarily to the underlying causes of unemployment and disability rather than placing emphasis upon paying its citizens for being unemployed or sick. It should encourage its citizens to provide against such contingencies by education, by savings, by insurance and all other means available; and should provide for those whose needs are inevitable by a judicious system of public assistance, rather than by fastening upon the whole American people a vast compulsory social insurance program administered by an ever-growing bureaucracy."

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

J. F. Du Bois, M.D., Secretary

Columbia Heights Midwife Pleads Guilty to Attempted Abortion

Re State of Minnesota vs. Hilda Helander.

On September 28, 1943, Mrs. Hilda Helander, sixty-five years of age, 4305 Fourth Street N.E., Columbia Hights, Anoka County, entered a plea of guilty in the District Court of Anoka County, to the crime of attempted abortion. Mrs. Helander, a licensed midwife,

was sentenced by the Hon. Leonard Keyes, Judge of the District Court, to a term of not to exceed two years in the Women's Reformatory at Shakopee, Minnesota. Because of the defendant's age and the condition of her health, the Court placed the defendant on probation for a period of two years. The defendant has a married daughter who lives on a farm near Outlook, Montana, and she stated to the Court that she desired an opportunity to permanently reside with her daughter. This arrangement was approved by both the County Attorney of Anoka County and legal counsel for the Medical Board. The defendant was also required to surrender her midwifery license for cancellation.

Mrs. Helander was arrested on July 11, 1943, following the admission of a nineteen-year-old Minneapolis girl to Deaconess Hospital. The girl, who was critically ill, while an unwilling witness, finally disclosed that she had gone to Mrs. Helander on July 8, 1943, for a criminal abortion. The amount of $25.00 was paid to Mrs. Helander. The girl ultimately recovered.

The Minnesota State Board of Medical Examiners wishes to acknowledge the splendid coöperation received in this case from Deaconess Hospital, the attending physician, Mr. Charles P. LeRicheux, County Attorney of Anoka County, and Deputy Sheriff L. A. (Mike) Auspos of Anoka County. Splendid assistance was also given by members of the Women's Bureau of the Minneapolis Police Department, notwithstanding the fact that the defendant resided just outside the Minneapolis city limits.

Minneapolis Pharmacist Pleads Guilty to Illegal Sale of Nembutal

Re: State of Minnesota vs. Casmer A. Sathre.

On October 5, 1943, Casmer A. Sathre, forty-two years of age, entered a plea of guilty in the District Court of Hennepin County, to an information charging him with the illegal sale of nembutal. Following a statement of the facts to the Court, the Hon. Edmund A. Montgomery, Judge of the District Court, sentenced the defendant to pay a fine of $200, or to serve one year in the Minneapolis Workhouse. The defendant elected to pay the fine.

Mr. Sathre, who is a registered pharmacist and operates his own store at 1825 E. Lake Street, Minneapolis, was arrested following a joint investigation made by the authorities of Anoka County and Hennepin County, the Minneapolis Police Department and the Minnesota State Board of Medical Examiners into the death of a thirty-nine-year-old Minneapolis woman. The deceased was found dead at the home of a daughter in Anoka on August 22, 1943, under circumstances indicating an overdose of nembutal. While the defendant denied having sold any of the barbiturates to the deceased immediately prior to her death, he admitted that he had refilled, on three or four occasions, without authorization, a prescription written by a Minneapolis physician in February, 1942, for the deceased.

This is the first prosecution under the 1939 State Law restricting the sale of the various barbital preparations to the written prescriptions of one authorized to issue the same, or to an authorized refill of such a prescription. The law was sponsored by Senator Harry L. Wahlstrand of Willmar, Minnesota, and had the endorsement of the Minnesota State Medical Association. The tragic death in the instant case illustrates the danger of the promiscuous sale and use of these drugs. The penalty imposed by the Court should serve as a warning that there will be no financial gain to those who violate this law. The maximum penalty is a fine of $1,000 or one year in jail. Splendid coöperation was received in this case from Mr. Charles P. LeRicheux, County Attorney of Anoka County, Mr. A. C. Horejs, Coroner of Anoka County, Captain James Mullen of the Minneapolis Police Department, Dr. Russell R. Heim, Coroner of Hennepin County, Mr. Michael J. Dillon, County Attorney of Hennepin County, and Mr. Otto Morck, First Assistant County Attorney of Hennepin County.

UNCLE SAM DRAFTS SUPPLY OF OIL OF PEPPERMINT

The entire supply of oil distilled from the peppermint plant has been ordered set aside for government action to secure a just distribution.

Oil of peppermint is important in both food preparations and pharmaceutical uses, particularly for menthol production. Most of the menthol used in the states was formerly imported from Japan.

American farmers since the war have attempted to increase the production of oil of peppermint to meet growing civilian, military and Lend-Lease requirements. Most of the United States supply is produced in Michigan, Indiana, Ohio, California and Oregon. Unfavorable weather conditions this year caused domestic production to fall short of the goal.—*Science News Letter,* October 23, 1943

CLINICAL-PATHOLOGICAL CONFERENCE

(Continued from Page 991)

media, as found in syphilitic aortitis. The wall of the aneurism is fibrous and thin. The thrombus in the aneurism is hyaline but not organized. The lungs show severe pneumonia. This is one instance where a Mexican has a chronic cough and weight loss due to something other than tuberculosis.

Dr. Hertzog: The large thrombus present in this aneurism explains why it did not pulsate. Thrombosis in an aneurismal sac is a protective phenomenon and helps to prevent rupture. This man died of bronchopneumonia. Dr. Rudolph Matas in New Orleans many years ago attempted to produce thrombosis in aneurysmal sacs by introducing coiled gold wire into the sac. One difficulty was that the wire would not always remain in the sac. The opening in this saccular aneurism was extremely small. Coughing is a common symptom in aneurisms of the arch of the aorta due to stretching of the left laryngeal nerve. Syphilis causes nearly all aneurisms of the arch of the aorta. However, it should be remembered that arteriosclerotic dissecting aneurisms may involve the arch of the aorta and the majority of aneurisms of the abdominal aorta are on the basis of arteriosclerosis, rather than syphilis.

Anatomical Diagnosis: (1) Aneurism of arch of aorta; (2) syphilitic aortitis; (3) bilateral bronchopneumonia.

INDUSTRIAL HEALTH

Edited by the Committee on Industrial Health and Occupational Diseases

A. E. Wilcox, Minneapolis, Chairman

H. B. Allen, Austin
L. S. Arling, Minneapolis
Martin Aune, Minneapolis
Richard Bardon, Duluth
P. H. Bennion, Saint Paul
R. B. Bray, Biwabik
R. P. Caron, Minneapolis
T. H. Dickson, Saint Paul
T. A. Lowe, South Saint Paul
J. L. McLeod, Grand Rapids
C. M. Smith, Duluth
H. G. Wood, Rochester

STANDING ORDERS FOR NURSES IN INDUSTRY

For some time the medical and nursing professions have been concerned about the employment of nurses in industry without adequate medical supervision. The Council on Industrial Health has therefore been requested to formulate standing orders for industrial nurses which can be adapted to meet the requirements of individual industrial medical departments. If no responsible industrial medical authority exists, it is recommended that the nurse request helpful instruction in this regard from the committee on industrial health of the appropriate county or state medical society.

General Relationships

Standing orders represent a preliminary understanding between physician and assisting personnel about routine conduct of a medical service. In establishing such orders in an industrial medical department, several considerations need to be borne in mind:

1. The greater the amount of personal supervision exercised by the physician directly in the industrial environment, the better is the industrial health service.
2. Standing orders cannot be written to meet every situation likely to arise in industry. They must be modified to meet specific requirements and in accordance with the training and professional competence of the assisting personnel. They should be signed by the supervising medical authority and posted prominently in the medical department.
3. The nurse in industry should assume no responsibility for service outside the field of her professional training. This applies particularly to individual case management, from which the nurse should rigidly abstain except:
   (*a*) In emergencies demanding immediate independent judgment and action.
   (*b*) Procedures of preliminary or first aid nature routinely required by reason of the nature of the work and which are clearly stipulated in the standing orders.

This statement confines itself mainly to these last named aspects of medico-nursing relations in industry. Additional reports on other functions of industrial nurses will follow as needed.

Emergency Procedure in Industry

General principles which operate in all emergency situations apply to industry as well. They are:

1. Call a physician immediately.
2. Stop bleeding.
3. Restore breathing.
4. Prevent shock and infection.
5. Do no more than is actually needed.

The supervising physician should assure himself that these instructions are thoroughly understood and should institute special training when necessary. Nurses in industry should qualify as first aid instructors.

Emergency Supplies.—Emergency packs with essential sterile supplies should be available at all times in the medical department and in first aid kits suitably located throuhout the plant. Regular inspection is necessary.

Hemorrhage—Bleeding calls for immediate attention. The nurse should notify the physician and, until he arrives, proceed as follows:

1. Expose the wound.
2. Remove obvious foreign matter.
3. Apply pressure.

Direct manual or bandage pressure firmly applied over sterile gauze packing at the bleeding site will effectively control moderate hemorrhage. Indirect compression is indicated in excessive bleeding not controllable by direct methods. Digital compression over the vessel against underlying structures either adjacent to the wound or at the nearest pressure point will usually suffice until the physician arrives. Indirect pressure should be applied proximal or distal to the wound, in keeping with the arterial or venous character of the bleeding. Hemostats or clamps should be applied whenever the emergency warrants it.

Avoid applying a tourniquet if possible. If severe bleeding in an extremity suggests the use of a tourniquet, apply a blood pressure cuff.

The nurse should remember that:

1. A direct pressure bandage should not act as a tourniquet.
2. A tourniquet must be periodically released at least every fifteen minutes.
3. No dressing should be applied over a tourniquet.
4. Asepsis must be observed at all times.

Asphyxia.—Cessation of breathing from any cause demands:

1. Artificial respiration *at once* and *at the site of the accident.*
2. Notification of the physician.
3. Maintenance of body warmth. Avoid excessive heating.

All industrial nurses should demonstrate ability to apply artificial respiration by the prone pressure method and should realize the need for its continuous application until breathing is restored or until careful repeated medical examination advises otherwise.

Shock.—Early and adequate shock treatment is life saving. Do not delay.

Common symptoms of shock following injury are pallor, perspiration and rapid thready pulse. Emergency management by the nurse should include:

1. Notification of the physician.
2. Removal of cause. If shock is due to hemorrhage, control it. If it is due to trauma not associated with bleeding, all active treatment of injury should be deferred until shock management has been in-

Reprinted by permission from *The Journal of the American Medical Association,* August 28, 1943, Vol. 122, pp. 1247-1249.

stituted. Wounds should be covered with sterile dressings to prevent infection.

3. Relief of pain: 1/6 to 1/4 grain (0.010 to 0.016 Gm.) of morphine sulfate, repeated if necessary, or barbiturates as routinely ordered except in injuries to the head or trunk.
4. Keeping the patient warm, dry, and on his back with his head low. Avoid overheating.

Routine Nursing Care of Injuries

Successful medical management of industrial injuries depends on:

1. Prompt treatment.
2. Meticulous cleansing and dressing.
3. Examination of deep as well as of superficial structures.

To accomplish these aims the routine functions of the nurse should be confined to care of minor wounds as follows:

1. Protect wound with sterile gauze while adjacent area is cleansed with soap and water or solvent.
2. Discard protective dressing and clean wound margins.
3. Irrigate wound with sterile water or isotonic solution of sodium chloride.
4. Apply antiseptic of physician's choice.
5. Apply dry sterile dressing, interfering as little as possible with function. Sterile dressings should be covered with protective material for use at work. The worker should be instructed not to remove the dressing but to return to the medical department if it becomes loosened or uncomfortable.

The nurse should do no more than is actually needed. The following conditions require direct medical supervision:

1. Wounds requiring débridement.
2. Those with obvious or suspected involvement of deep structures.
3. Wounds with edges which do not approximate.
4. Wounds about the head and face.
5. Contaminated wounds requiring tetanus prophylaxis.

Management of Common Injuries.—Injuries most likely to be encountered in industry include the following conditions:

1. Abrasions: Clean and apply dry dressing. Extensive or deep loss of skin, especially about the fingers and hands, needs medical attention.
2. Contusions: Treat with cold compresses directly following injury, later with moist heat. If soreness or disability persists or if deep involvement is suspected, refer to the physician.
3. Lacerations: Clean and apply dressing as directed. Any possibility of injury to joints, nerves or tendons should be brought to the physician's attention at once.
4. Puncture Wounds: Puncture wounds through the skin need direct medical supervision to avoid or treat severe infection. If superficial, clean and apply sterile dressing.
5. Slivers and Splinters: Penetration through the skin by slivers or splinters always carries the risk of an infected puncture wound and should be treated as such. Those lodged superficially and easily removed without added trauma or incision may be extracted aseptically by the nurse.
6. Burns and Scalds: Clean minor burns with soap and water. Apply petrolatum or 5 per cent boric acid ointment, bandaging firmly without interfering with function. Leave blisters alone.

   In all other cases:

   (*a*) Notify the physician.
   (*b*) Cover the burned area with a sterile dressing or sheet moistened with isotonic solution of sodium chloride or 5 per cent sodium bicarbonate solution.
   (*c*) Combat pain and shock.

In the absence of specific orders, chemical burns should be treated by irrigation or immersion in water for at least twenty minutes and then by dressing.

7. Sprains and Strains: Treat first with cold compresses, elevation of the part and rest. A physician's advice is necessary regarding strapping, other methods of support or fixation, further examination or special therapy.

Fractures

Preliminary steps for the nurse are:

1. Call a physician at once.
2. Keep the patient quiet and warm.
3. Immobilize before any movement is atttempted.
4. Do not attempt reduction.
5. If the fracture is compounded, cover the site of the fracture with a dry sterile dressing. *Do not cleanse or reduce.*

Special instruction in splinting should be provided every industrial nurse.

Eye Injuries

Rigid asceptic technique must be scrupulously observed in all eye conditions. Never attend consecutive patients without sterilization of instruments and careful hand washing. Remember that early symptoms of infection simulate foreign body.

Minor Burns.—Do not apply ointments to minor burns of the skin about the eye. Apply a sterile dressing and refer to the physician.

Burns of the Eye.—1. Chemical Burns: Irrigate chemical burns of the eye *copiously* and *at once* with water, preferably by immersion. Neutralizing solutions are usually inadequate or unavailable. The rapidity with which the irrigation occurs is more important than the type of solution used. Continue to irrigate at least twenty minutes by the clock.

2. Hot Metal Burns: Aply a sterile pad and refer at once to the physician. Do not irrigate. An anesthetic should be aplied as ordered by the doctor.

Every burn of the eye should receive competent medical attention early.

Foreign Bodies.—The nurse should attempt to remove only those foreign bodies of the eye which can be readily located and which can be easily washed out or removed with a dry sterile cotton applicator. An antiseptic may be applied if the physician so orders.

Direct medical care is essential:

1. If the foreign body cannot readily be located. Stains to aid in the location of foreign bodies should be used only on specific medical order.
2. If removal requires any instrumentation.
3. If irritation or pain persists after removal.

No person with an eye injury should be discharged without examination by a physician.

"Flash" Injury.—First aid treatment should include:

1. Local anesthetic as ordered.
2. Cold compresses.
3. Sedatives.

Persistent pain following flash needs medical examination and treatment.

Conjunctivitis.—Conjunctivitis or other forms of conjunctival irritation should be referred routinely to the physician or ophthalmologist.

Head Injuries

Until the physician takes over, the nurse should:

1. Keep patient lying down.
2. Elevate the head.
3. Apply ice cap or cold compress. *No sedatives.*
4. Record pulse and respiration every ten minutes.

Clip or shave and cleanse areas adjacent to scalp lacerations, and cover with a sterile pad.

Chest and Abdominal Injuries

Contusions of the chest and abdomen with or without external evidence of injury may result in trauma to underlying organs.

Until seen by the physician, such patients must be:

1. Kept warm and quiet.
2. Allowed no sedatives.
3. Have pulse, temperature and respiration recorded frequently.
4. Suitably bandaged to avoid contamination.

In case of abdominal injury give nothing by mouth.

Nonoccupational Illness

Treatment of injury or illness which has no relation to occupation is not a function of the industrial medical department except:

1. First aid for emergency sickness. Such measures as the situation demands must be taken until notification of the family physician discharges responsibility.
2. For minor ailments which temporarily interfere with an employe's comfort or ability to complete a shift and for the relief of which a physician would not ordinarily be consulted.

In all relationships of this kind, judgment and tact are required of the industrial nurse. Several principles apply:

1. Before giving any treatment, the temperature, pulse, general appearance and a history of the presenting complaint should be recorded.
2. Palliative treatment, especially for chronic or recurring disorders, should not be repeated.

Every properly trained nurse understands the difference between attention of this kind and systematic treatment.

Care of Minor Illness and Symptoms

Persistent or augmenting symptoms of irritation, discomfort or disability suggest faulty work environment. The nurse should not hesitate to ask for medical examination of workers and of the premises.

Fever.—A rise in temperature of 1 degree suggests medical consultation before work is resumed. Findings should be checked by repeated thermometer recordings.

Headache.—Record temperature. If headache is accompanied by dizziness, nausea, vomiting, stiff neck, injury, history of recurrence, fever, general malaise or other symptoms the patient needs medical attention. If not, give an analgesic as ordered by the physician.

Remember that headache or dizziness may be premonitory signs of intoxication.

Unconsciousness.—1. Fainting. Usual symptoms are pallor, with shallow breathing, slow and weak pulse. Period of unconsciousness is of short duration.

Keep the patient lying down with head lowered until fully recovered. Be sure the patient has plenty of fresh air. Clothing should be loosened and stimulating inhalants used, such as ammonia or smelling salts.

2. Other causes. If other signs are present or if unconsciousness persists longer than a few minutes, call for medical assistance. *Give nothing by mouth.*

Toothache.—If there is a cavity, the nurse may pack it with cotton dipped in oil of cloves for temporary relief. For further examination and treatment refer to a dentist.

Nosebleed.—Spontaneous nosebleed may be treated by cold packs or pinching the sides of the nose against the septum. Keep the patient sitting erect or standing and loosen the collar if it tends to constrict the neck. Advise the patient not to breathe or blow through the nose for an hour or two after bleeding has stopped.

Bear in mind that certain occupational exposures are manifested by nasal damage and bleeding.

Sore Throat.—Patients with sore throat may be given a hot saline gargle if they have a normal temperature. Do not "paint" the throat. Any persistent sore throat or one associated with fever needs medical care at home.

Respiratory Irritation or Infection.—Repeated or persistent signs of bronchial or chest irritation without associated infection suggests an unfavorable occupational exposure. A plant hygiene survey is indicated.

Persons having acute respiratory infections with elevated temperature, cough, sneezing or nasal discharge should be sent home for proper segregation, rest and medical attention. In mild infections, work may be continued if under medical or nursing supervision simple measures will control symptoms and prevent spread.

Available medical evidence at the present time cannot support routine administration of cold vaccines or vitamin preparations as methods of reducing the incidence or severity of acute respiratory infections.

Frequent colds or chronic respiratory conditions require special medical consideration.

Abdominal Distress.—Early signs of occupational intoxication may be abdominal in character. In any case abdominal distress, nausea or pain, especially if severe or persistent, requires competent medical diagnosis and management.

Laxatives should never be dispensed from an industrial medical department.

Dysmenorrhea.—Painful menstruation not associated with fever or gastrointestinal disturbances may be treated with an analgesic ordered by the physician and the patient placed at rest with heat to the lower part of the abdomen. If there is no relief or if other signs or symptoms present themselves, she should be referred to her physician.

Patients with recurrent severe dysmenorrhea should not be given palliative treatment. They should be referred for examination and treatment.

Dermatitis

Management of skin disorders in industry depends on cause.

Specific Irritants.—Materials or processes in the plant capable of causing skin disease should be identified and special orders provided for control. Competent dermatologic consultation is essential in all obscure or refractory situations.

Nonspecific Skin Disease.—Nonspecific skin irritation in industry is almost entirely assignable to faulty personal hygiene. The nurse can do much to improve washing routine, the use of dependable protective coverings, the wearing of clean work clothing, maintenance of satisfactory housekeeping in the plant and the general maintenance of accepted hygenic procedure.

Pregnancy

A definite policy regarding employment during pregnancy should embrace the following recommendations:

1. The employe should notify the proper authority in industry about her pregnancy within the first trimester.
2. She should obtain a statement from her own physician—
   (*a*) That her work is not contraindicated.
   (*b*) Regarding the length of time she should work.
3. Special attention should be given to the nature of the work. Pulling, pushing and lifting must be kept within safe limits. Rest periods will tend to minimize emotional and physical instability during pregnancy.

4. Ordinarily work should terminate by the thirty-second week (within six weeks of term). If contraindications arise within this period, the employment should stop.
5. Return to work is inadvisable before six weeks after delivery and then only on notification of the employer by the physician.

Equipment and Supplies

Space which can command privacy and which can be kept clean and properly prepared for emergency and routine services by the nurse should be provided in the plant. Special attention should be given to heating, light, ventilation and accessibility.

Furnishings and Supplies

General Furnishings:
1. Sink
2. Instrument cabinet
3. Sterilizer
4. Dressing table
5. Leg rest
6. Cot
7. Stretcher
8. Mirror 10 by 12 inches
9. Foot-pedal waste can
10. Waste basket
11. Storage cabinets
12. Paper towel rack
13. Adhesive rack
14. Record file
15. Scale

Instruments and Supplies:
1. Scalpels
2. Splinter forceps
3. Tissue forceps
4. Hemostatic forceps
5. Bandage scissors
6. Surgical scissors
7. Hand magnifying glass
8. Syringes
9. Assorted hypodermic needles
10. Assorted surgeons' needles
11. Needle holder
12. Assorted bandages
13. Adhesive plaster
14. Cotton
15. Applicators
16. Assorted sutures
17. Assorted splints
18. Assorted jars and basins
19. Test tubes
20. Safety razor and blades
21. Hot water bottle
22. Ice cap
23. Crutches
24. Tourniquet

Drugs: (as ordered by the physician or medical adviser)
1. A stimulant
2. An emetic
3. Analgesics and sedatives
4. Antiseptics

The accompanying check list of furnishings and supplies suitable for a small plant dispensary should be augmented by equipment for emergency treatment or other special medical requirements as ordered by the plant physician or other medical adviser.

References

American Red Cross First Aid Text Book, P. Blakiston's Son & Co., Inc., 1012 Walnut Street, Philadelphia.

National Research Council: Burns, Shock, Wound Healing and Vascular Injuries, Philadelphia, W. B. Saunders Company, 1943.

Sappington, C. O.: Essentials of Industrial Health, Philadelphia, J. B. Lippincott Company, 1943.

Division of Industrial Hygiene, U. S. Public Health Service: Manual of Industrial Hygiene, Philadelphia, W. B. Saunders Company, 1943.

Johnstone, Rutherford T.: Occupational Diseases, Philadelphia, W. B. Saunders Company, 1941.

Occupational Hazards and Diagnostic Signs, Bulletin 41, Division of Labor Standards, U. S. Department of Labor, U. S. Government Printing Office, Washington, D. C., 1941.

Wampler, Fred J.: Principles and Practice of Industrial Medicine, Baltimore, Williams & Wilkins Company, 1943.

Publications of the Council on Industrial Health, American Medical Association, 535 North Dearborn Street, Chicago:
(*a*) The Industrial Medical Department.
(*b*) Plant Hygiene Studies.
(*c*) Outline of Procedure for Physicians in Industry.
(*d*) Women in Industry.
(*e*) Control of Common Respiratory Infections.
(*f*) Indiscriminate Administration of Vitamins to Workers in Industry.
(*g*) Recognition and Prevention of Industrial Dermatitis.

MENINGITIS STOPPED

Meningitis epidemics can be stopped almost immediately by prophylactic use of sulfadiazine, Col. Dwight M. Kuhns and Capt. Harry A. Feldman, of the Army Medical Corps, reported at the wartime conference of the American Public Health Association, from their experience in the Fourth Service Command.

Chief difficulty heretofore in stopping a meningitis epidemic has been that, although the patients were isolated, it was impractical if not impossible to find and isolate all the healthy carriers of the germs.

Giving small doses of sulfadiazine to all the personnel of a single unit at the same time immediately after the first cases signal the approach of an epidemic will immediately eliminate all the carriers and at the same time reduce the attack rate, or new cases, almost to zero, the Army medical officers found.

Careful laboratory methods for detecting the carriers and identifying the type of meningococcus they carry are important, they emphasized. The type of germ predominating is a forecast of the extent and rapidity of the impending epidemic.

The laboratory and prophylactic methods worked out for the Army, they state, can be applied equally well to certain civilan groups, such as schools, orphanages, asylums, camps and the like.—*Science News Letter,* October 23, 1943.

STATISTICS SHOW THAT CANCER IS CURABLE

Too many people still look on cancer as an absolutely hopeless condition. Dr. Ira T. Nathanson, of Harvard Medical School, challenges this gloomy view. (*New England Journal of Medicine,* Sept. 16.)

"It is a well-accepted fact," he declares, "that present-day treatment is effective in the early stages of the disease, before it has spread to distant organs or tissues that are essential to life. Moreover, the prognosis is far from hopeless, even in more advanced cases."

In several forms of cancer, he adds, "the rate of cure is higher than that of some other diseases."

The chances for any given patient being cured of cancer depend on many factors, such as the location of the cancer, the type of cancer, and how early in the disease treatment is started.

In cancer of the skin, for example, the curability rate is 48 to 68 per cent. In cancer of the breast the relative curability rate, based on results five years after operation, ranges from 30 to 51 per cent. The absolute curability rate, for all patients who have treatment of any kind including that which is merely palliative is 22 to 28 per cent. In cancer of the stomach, the five-year curability rate of all patients who enter the hospital is 5 per cent. When operation is possible, however, and it is in about half the patients with stomach cancer, the outlook is much brighter, with survival rates of from 15 to 50 per cent.

Even when cancer is discovered too late for an absolute cure to be achieved, suitable treatment can often give the patient many months or even a few years more of comfortable life. No one who thinks he has cancer should feel too discouraged or frightened to see a doctor. The condition may not even be cancer, and if it is, the outlook may be much brighter than he thinks.—*Science News Letter,* October 23, 1943.

Minnesota Academy of Medicine

Meeting of May 12, 1943

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Minneapolis Club on Wednesday evening, May 12, 1943. Dinner was served at 7 o'clock and the meeting was called to order at 8:15 by the President, Dr. H. B. Zimmermann.

There were forty-nine members present.

Minutes of the April meeting were read and approved.

The scientific program followed.

Dr. Wallace Cole, of Saint Paul, gave a lantern slide talk on some orthopedic cases.

ENTEROGENOUS CYSTS OF THE RECTUM

HAROLD E. HULLSIEK, M.D.

Saint Paul, Minnesota

Enterogenous or enteric cysts occur not infrequently at many points along the intestinal tract, but a search of the literature for the past ten years reveals but few located in the rectum. McLanahan and Stone, in *Surgery, Gynecology and Obstetrics,* say, "Enteric cysts . . . are of peculiar interest not only because of their rarity but also because of the problem they present in diagnosis and the speculation they stimulate as to their origin." They refer to them as unusually rare tumors and report two cases, one in an infant and one in a man sixty-eight years old. Evans, in an extremely comprehensive article in the *British Journal of Surgery* describes cases in which cysts occurred in the esophagus, stomach, duodenum, jejunum, ileum, ileocecal region, vitello-intestinal tract, and sigmoid, but none in the rectum.

He thinks that epithelial misplacements in the intestinal tract, either cysts or diverticula, originate in the diverticula found in the developing embryo. I believe another factor entering into the formation of anorectal cysts is the presence of the deep epithelium-lined tracts starting in the columns of Morgagni. Lately considerable investigation of these structures has been carried out, the results of which make it evident that these ducts are the etiologic factor in many peri-anal abscesses, fistulæ, and blind internal sinuses. There seems to be no valid reason why they might not, in the absence of inflammation, produce cysts.

Considered histologically, enteric cysts usually show the same lining structure as that of the normal bowel with which they are contiguous, but may be found to exhibit every known variation in the mucosal layer. In some, the changes in the lining of the cyst cavities are explained by intracystic tension or inflammation. Ewing says "The cavity is usually single and the contents are mucinous, colorless, yellowish, or brownish fluid. The wall resembles that of the intestines and may contain smooth muscle, mucosa, crypts, lymphoid tissue and a lining of cylindrical, stratified or cuboidal epithelium." The commonest sites are the ileum at the point of Meckel's diverticulum, in the mesentery, or near the umbilicus. They may be submucosal, intermuscular, subperitoneal, or intermesenteric.

The symptoms are governed by the size of the cyst, its location, its encroachment on other organs, and the presence or absence of inflammatory change. In my patients, the cysts were easily felt with the finger as extra-rectal masses, fairly firm, tensely fluctuating in two cases, and varying in size from that of a hazelnut to a walnut. The absence of severe pain together with a relatively low leukocyte count make easy the differentiation from pari-rectal abscess. These masses do not feel like new-growths, and on proctoscopic examination the absence of any change in the mucosa may be noted. I should like to report four cases.

Case 1.—Miss J. L. is a white, unmarried woman, aged thirty-three. For the past two months she has felt a sensation of pressure in the rectum, together with an inability to completely empty the rectum. There was no actual pain and no bleeding. On digital examination a mass was felt in the right anterior quadrant of the rectum immediately above the sphincter, and one in the right posterior quadrant. These were about the size of hazelnuts, fairly firm, and it was thought, fluctuating slightly. Except for a slight reddening over one cyst, there was no change in the mucosa. The leukocyte count was 12,500.

Under sacral anesthesia the anal canal was relaxed and the tumors visualized. They were estimated to be respectively 2 cm. and 1 cm. in diameter. The one on the left side was grasped by a forceps and partially prolapsed. It was incised and a cloudy, gelatinous substance escaped. The same procedure was followed on the second mass. The cysts showed definite cavities, the edges of which were widely trimmed off in an effort to convert the cavities, into continuous portions of the rectal wall. They were packed temporarily with iodoform gauze. The patient left the hospital on the sixth day, and shortly afterward was discharged, examination having shown the cavities practically obliterated.

Case 2.—Mr. H. W. is a white man, aged thirty-four. He complained of pain and tenderness in the anal canal, which was associated with slight showing of fresh blood, with an exaggeration of the symptoms each time the bowels moved. Examination showed a deep, chronic anal ulcer at the right of the posterior commissure, which explained the pain at stool and bleeding. Digital examination, however, revealed a tense and slightly tender mass beneath the mucosa of the posterior rectal wall. His leukocyte count was 11,000. A diagnosis was made of an anal fissure, and of a probable cyst of the rectum.

He was operated upon under sacral anesthesia, at which time a deep ulcer was dissected from the pos-

terior commissure, and a partial proctotomy done. The mass in the rectal wall was incised and contained a glairy, mucinous material. The edges of the cyst were removed and the cavity packed. He was discharged from the hospital on the fifth day. He was seen in the office every three or four days and shortly it was seen that the cavity was pocketing, and not flattening out to become a part of the rectal wall. It had too small an opening and was filling up with debris and not emptying properly. He was readmitted to the hospital twenty-five days after his first admittance, and again under sacral anesthesia, was operated on. This time the edges were trimmed more widely and the cavity packed as before. He left the hospital in three days and his convalescence from then on was uneventful. He has since completely recovered.

Case 3.—Miss P. B. is a white, unmarried woman, aged sixty. She states that for the past two months she has had a sensation of weight and slight aching in the rectum. The bowels are regular and there has been no bleeding. Examination shows a firm mass the size of a walnut beneath the mucosa on the left side of the rectum. It is not movable, and is only tender on very firm pressure. Her leukocyte count was 9,650. Diagnosis was made of a rectal cyst.

She was operated upon under sacral anesthesia, the mass found to be a cyst filled with cloudy gelatinous material. The cavity was marsupialized and packed. The pathological report on the tissue removed reads as follows: Section shows a fibromuscular tissue which is edematous and infiltrated with plasma cells and leukocytes. Diagnosis: Wall of a chronic abscess. This illustrates Ewing's statement that many changes found in the linings of the cysts can be accounted for by intracystic tension or inflammation. The histological picture here is one of inflammation, and yet this was very evidently not primarily an abscess. This patient was discharged on the eighth day, and made an uneventful recovery.

Case 4.—Mrs. M. M. is a white, married woman, aged thirty-five. Two and a half years ago she had what she thinks was a rectal abscess opened through the rectum. Six months ago she had the same procedure done, both operations having been performed in another city. For the past two weeks she has had rectal pain, not severe, and not associated with bowel movements, together with a sense of fullness in the rectum. There has been no rectal bleeding. Examination showed an indurated, slightly tender mass in the rectal wall on the left side. Anuscopic examination shows no change in, or involvement of, the rectal mucosa. There is no external tenderness on deep pressure. Her leukocyte count is 15,000. A diagnosis was made of probable cyst of the rectum.

She was operated upon under sacral anesthesia, the tumor mass on the left side being incised, with the escape of a clear mucinous substance. The cyst cavity was treated as were the former ones, and she left the hospital on the eighth day. Her recovery was uneventful.

Summary

Enteric cysts may occur at any point along the intestinal tract, but are apparently relatively rare in the rectal area. Their origin is assumed to be in small diverticula formed during fetal life, some of which later close off completely to form cysts. Histologically their linings resemble the elements of the adjacent bowel, but are capable of many variations.

The diagnosis is not difficult and the cyst, when found, should be treated surgically. In my cases they were treated from within the rectum, but may, especially if the cyst is large and accessible, be removed through a skin incision.

References

1. Buie, L. A.: Proceedings Staff Meeting, Mayo Clinic, October 18, 1939.
2. Evans, A.: Developmental enterogenous cysts and diverticula. Brit. J. Surg., 17:34-83, 1929.
3. Ewing, James: Neoplastic Diseases. p. 1030. Philadelphia and London: W. B. Saunders Co., 1931.
4. McLanahan, Samuel and Stone, Horvey B.: Enterogenous cysts. Surg., Gynec. and Obst., 58:1029, 1934.
5. Petit de La Villeon, M.: Kyste congenital du rectum. Bull. et mem. Soc. de med. et chir. de Bordeaux, p. 39, 1915.

Discussion

Dr. Arnold Schwyzer, Saint Paul: The question is —How do these cysts happen? How can the epithelium be outside of the rectal wall?

Quite a number of years ago, Tavel, an excellent Swiss surgeon, wrote a paper on this subject and he showed that the ordinary Lieberkuhn glands in the colon and sigmoid become longer in the rectum and when you get down toward the lowest portion of the rectum they become very long and deep. He showed sections where they go not only all through the bowel wall but into and through the internal sphincter. That must be the origin of these cysts. The cysts are simple in appearance and we must consider them as something like retention cysts from the abnormally deep-seated fundi of these lower rectal glands.

Dr. Hullsiek, in closing: I am fairly certain that these cysts do not occur frequently—what Dr. Schwyzer says is quite true. The ducts that start in the crypts of Morgagni may be very deep and may form sinuses, cysts, or abscesses. There may be multiple small cysts, but those in my cases were producing symptoms and were evident on examination. I know I have not seen others since every mass I have encountered in the rectum has been explored. The type mentioned by Dr. Zimmermann was further up the rectum and very likely developmental in origin.

If the cysts are not large, it seems to me easier to operate on them intrarectally. In large ones, if accessible, one may have to take out the coccyx and remove the cyst through a skin incision. One of my patients I saw in 1928; the other three have occurred in the last two years. These are the only ones I have encountered in many hundreds of rectal examinations.

ACUTE OBSTRUCTION OF THE BOWEL

A. E. BENJAMIN, M.D.

Minneapolis, Minnesota

I desire to report a case of acute obstruction of the bowel. Obstruction of the bowel is much easier to diagnose now than it was twenty to thirty years ago. There is little excuse for a patient dying from obstruction of the bowel nowadays. When I first began practice these cases were less easily handled.

The case I'm reporting tonight is a single man, sixty-three years of age, a farmer. His case is interesting because of the various troubles and complications he has had. When I saw him first in 1938, he suffered with an incisional hernia from an old appendectomy with drainage. He also had a right inguinal hernia, hemorrhoids and a right-sided hydrocele.

This patient was operated on elsewhere for a ruptured appendix in 1925 and following this he had suffered more or less with constipation and abdominal pains in the lower right side and had gradually developed a large incisional hernia. He occasionally had symptoms of acute obstruction.

Just previous to the time I saw him first, these obstruction symptoms were quite pronounced. Upon ex-

What to Tell Your Patients about KARO in Wartime

The exigencies of wartime production have not affected the purity, quality and effectiveness of KARO as a milk modifier.

However, some grocers may be temporarily short of either *Red* label or *Blue* label KARO.

Since *both* types *are* practically identical in dextrin, maltose and dextrose content, *either may be used* in all milk mixtures. The slight difference in flavor in no way affects KARO's essential value for prematures, newborns and infants.



How much KARO for Infant Formulas?

The amount of KARO prescribed is 6 to 8% of the total quantity of milk used in the formula—one ounce of KARO in the newborn's formula is gradually increased to two ounces at six months.

CORN PRODUCTS REFINING CO.
17 Battery Place • New York, N. Y.

amination I found a large protruding incisional hernia which caused much pain. He wore a bandage which gave him some relief. The inguinal hernia, hydrocele and hemorrhoids caused additional discomfort. The hemorrhoids bled occasionally and the mucous membrane of the bowel prolapsed some. As the incisional hernia was the most distressing condition, we operated by taking out a portion of the skin over the hernial area. This skin was very thin and fixed to the underlying muscle. The gap in the abdominal wall was about 3 by 5 inches. The incision was extended downward and outward and the skin dissected from the fascia. A flap of fascia at the edge of the wound was dissected loose and turned upward over the defect in the abdominal wall. The underlying thin muscle was imbricated. The abdominal cavity was not opened. The fascia was stitched firmly so as to leave no dead spaces. This gave very good support and still left sufficient fascia and muscle for support below. The patient was troubled with some nausea and vomiting, so nasal suction was instituted.

While in the hospital we decided to repair the inguinal hernia and operate on the hydrocele, this we did two weeks after the incisional hernia operation, with a local anesthetic. The patient remained in the hospital about fifty-two days. Off and on he had some distress with his bowels and felt nauseated but finally recovered, felt well and went home.

In March, 1943, the patient returned having had some severe attacks of nausea, vomiting and pain. A partial obstruction apparently existed. He was operated on March 20, 1943, at which time we found omentum and intestines were quite badly adhered, especially at the old appendicial scar. On account of the intimate union of the parietal and visceral peritoneum, it was difficult to separate the bowel from the abdominal wall. The intestine was accidentally opened during the procedure but the rent was repaired at once. All disabling adhesions were corrected and the abdomen was closed. Nasal suction was used and a limited diet was continued for some time.

Finally, we decided to operate on the hemorrhoids. This was done about two weeks after the laparotomy. He made satisfactory progress for several days, when he began to have pain, some distention and nausea. Nasal suction was instituted. After three days' trial without definite improvement an operation was decided upon, especially as the x-rays confirmed our opinion.

A left-sided incision was made and two loops of small intestine, each twisted in the form of a volvulus and bands were found constricting the bowel. These were separated and the bowel untwisted. There were no adhesions to the abdominal wall where the previous operation had been made but a loop of small intestine was adherent to the abdominal wall near the hepatic flexure. This could only be corrected by a second incision over that point. This was made through the right rectus, the bowel separated and the abdomen closed.

After a rather stormy time, with the use of nasal suction and saline and glucose intravenously, the patient recovered, the bowels acted well and he felt well. There was a little sloughing of the fascia on the right side on account of imperfect circulation. The wound finally healed and the patient went home happy.

The meeting adjourned.

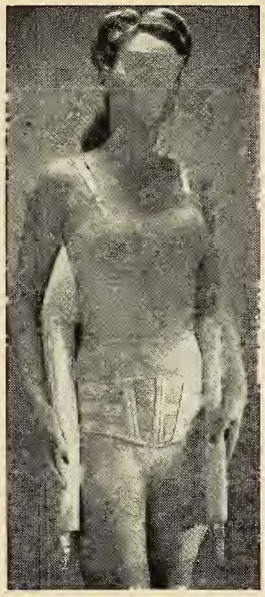
E. V. Kenefick, M.D.,
Secretary.

In Memoriam

LOUIS J. COOKE

With the death of Dr. L. J. Cooke, or "Doc" Cooke, as he was affectionately known by thousands of students and alumni, the University of Minnesota has lost its number one athletic personality. It is probable that more former students of the University found that they had more in common in Doctor Cooke than they had in any other person or thing connected with the University. Every student at the University for forty odd years knew him either directly or indirectly either as a coach, lecturer, toastmaster, administrator, medical examiner, all round good fellow, or as a competitor in some form of sport in which he was active. He left his mark on Minnesota athletics as no other person ever will. All minor sports at the University (except golf and tennis) along with intramural athletics were introduced there by him and then kept alive during their lean years until they attained full intercollegiate recognition. These included gymnastics, wrestling, fencing, hockey and swimming. Although some basketball was played at the University before he became attached to it, it was only when he took the sport over and became the coach that it became an organized activity. He installed a system of gymnastic work at the University including his now famous lecture course in Personal Hygiene. He promoted very successfully three great circuses at the University as a part of his physical program. At one time or another he served the University in one of the following capacities: Gymnasium Director, Medical Examiner, Basketball Coach, Baseball Coach, Minor Sports Coach, Director of Ticket Sales, President of the Western Intercollegiate Gymnastic Association, President and Co-founder of the Northwestern Gymnastic Association, Member of the Collegiate Basketball Rules Committee and Medical Director for the Student Army Training Corps during the last war. He was a competitor of no mean ability in baseball, basketball, handball, tennis and squash. Many a senior can remember Doc's curves and change of pace when he pitched in the traditional Senior-Faculty baseball game at commencement. He was equally at home afield with a fowling piece and could bring home his limit along with the rest of the boys. His whole outlook on life was competitive and he had an unconquerable desire to win, no matter what the issue was, whether tennis, getting excused from gym, or those tickets you wanted on the fifty yard line. Sooner or later you felt his great desire to be the winner of the bout. There were three great things in his life and they completely occupied and absorbed him—his job, his family and his church. He had no other interests. He always delivered the goods and more on his job. He was never late at home for dinner and could always be depended on to take the part of the old maid in the church play. There were never any activities in any of these fields that did not find him a stand-out leader and performer.

HAVE YOU PATIENTS WITH ANY OF THESE CONDITIONS?



Spencer Supporting Corset shown open, revealing inner support which is adjustable from outside the corset. Prescribed for conditions requiring positive abdominal support.

Each Spencer Support Is Individually Designed, cut and made for the one patient who is to wear it, to meet the specific condition. It is *guaranteed* never to lose its shape. The Spencer Corsetiere keeps in touch with patient to relieve the doctor of bother regarding fit and comfort.

Spencers are never sold in stores. For a Spencer Specialist, look in telephone book under "Spencer Corsetiere" or write to us.

- Hernia
- Ptosis
- Enteroptosis
- Nephroptosis
- Certain Cardiac Conditions
- Intervertebral Disc Extrusion
- Sacroiliac or Lumbosacral Sprain
- Spondylarthritis
- Spondylolisthesis
- Fractured Vertebrae
- Scoliosis, Kyphosis Lordosis
- Osteoporosis
- Postoperative Conditions
- Hysterectomy
- Herniotomy
- Appendectomy
- Cesarean Section
- Nephrectomy
- Cholecystectomy
- Colostomy
- Breast Conditions

SPENCER *INDIVIDUALLY DESIGNED*

Abdominal, Back and Breast Supports

SPENCER INCORPORATED,
137 Derby Ave., New Haven 7, Conn.
In Canada: Rack Island, Quebec.
In England: Spencer (Banbury) Ltd., Banbury, Oxon.

May We Send You Booklet?

Please send me booklet, "How Spencer Supports Aid the Doctor's Treatment."

.....M. D.

Address 011



From the painting by George FrederickWatts, "HOPE"

AS EVER-GROWING numbers of cases yield to liver therapy, pernicious anemia emerges from among the one-time "incurables." Today, men and women who must, can face this condition with justifiable optimism—for there is hope . . .

And so the laboring physician has two allies—a proven medicinal, and the fighting spirit of his patient.

When his choice of a liver product falls upon Purified Solution of Liver, Smith-Dorsey, he may count a third ally—the dependability of the maker. For Smith-Dorsey's product comes from laboratories capably staffed . . . equipped to the most modern specifications . . . geared to the production of a strictly standardized medicinal.

In that especially critical anemia case—as in all the others—you need a product of the caliber of

Purified Solution of

Liver

SMITH-DORSEY

Supplied in the following dosage forms: 1 c.c. ampoules and 10 c.c. and 30 c.c. ampoule vials, each containing 10 U.S.P. Injectable Units per c.c.

The
SMITH-DORSEY COMPANY LINCOLN NEBRASKA

Manufacturers of Pharmaceuticals to the Medical Profession since 1909

Louis J. Cooke was born in Toledo, Ohio, on February 15, 1868, and died at his home in Minneapolis on August 19, 1943. He attended public schools in Toledo and then went to the Y.M.C.A. Training School at Springfield, Massachusetts. He then attended the University of Vermont and matriculated in Medicine. During this time he was director of the local Y.M.C.A. physical activities and was a star pitcher on the Vermont star baseball team. He got his degree in medicine in 1894 and then left college to take up his career as a physical educator. He served as Y.M.C.A. physical director at Toledo, Ohio, Duluth, Minneapolis, and St. Paul. In February, 1897, while serving as Physical Director at the Minneapolis Y.M.C.A., he was induced to come to the University and take over direction of the physical education program. He worked part time until the end of the year and then in the fall he quit the Y.M.C.A. From September, 1897, until 1913 he served as gymnasium director and medical examiner and owned and operated a private gymnasium in downtown Minneapolis. In 1913 he became director of Physical Education for men and continued in his capacity of medical examiner. In 1922 when the Department of Athletics and Physical Education for men was created he became assistant to Mr. F. H. Leuhring who was chosen to head the new department. He continued in that capacity and as director of ticket sales until his retirement in 1936.

Doctor Cooke was not only a teacher of physical education, he was a pioneer in that field, and for that pioneering, the University and the Northwest in general owe him a great debt of gratitude. He established the Department of Physical Education at the University. He pioneered in the medical examination of college students and later aided in the establishment of the University Health Service. He introduced some major sports and nearly all the minor sports at the University. He originated the Michigan Jug tradition. He kept the jug hanging over his desk for years in the old armory and finally at a Michigan pre-game banquet he presented it and suggested that it be a trophy for the two teams. It is today the nation's outstanding college trophy. He was closely identified with many secondary physical education enterprises including the Western Intercollegiate Gymnastic, Wrestling and Fencing Association, the Northwestern Gymnastic Association, the Twin City Physical Education Association, Sigma Delta Psi, an honorary athletic fraternity, and many other lesser physical education activities.

The Doctor's contribution in basketball alone entitles him to immortality at the University. He played the game from its beginning and aided in its invention. He was still an excellent forward at the time of his retirement from active work. He coached several championship teams at the University and his 1919 team went through the season without a defeat.

Although he never held the position of Director of Athletics at the University, his greatness as an athletic personality was recognized in naming the new athletic

building, Cooke Hall, after him. This was an honor that few men have accorded them while still living.

He was a member of Alpha Kappa Kappa fraternity while in college, and installed the Minnesota chapter here in 1898. He continued active in chapter affairs until the time of his death.

To have accomplished so much in one lifetime with the help and aid of all concerned would have been a great attainment, but to have done so amidst the stresses and strains of a rapidly-developing institution with all its growing pains and striving for power, makes it really a colossal achievement. He kept right side up and kept going through several great struggles, including the fight between the students and the faculty for the control of athletics. He fought in these struggles when he had to but he usually had the advantage of his opponents because he fought for a cause instead of personal power. Athletic and Physical Education in the middle west will bear the imprint of his greatness for a long, long time. His death has been a great loss to the University, to the State and to the whole middle west.

W. K. Foster, M.D.

JOHN BUTLER

Dr. John Butler died at Northwestern Hospital, Minneapolis, on September 17, 1943. He was born in Berlin, Wisconsin, and spent his early years in that vicinity. After a period of railroad employment he, in company with his brothers, spent some time in Alaska where he was interested in mining.

In 1898 Dr. Butler entered the University of Minnesota Medical School, graduating in 1903. Associated there with the late Dr. Max Vanderhorck it was natural that he should become interested in dermatology. In 1910, after study in Europe, he limited his work to dermatology and practiced in Minneapolis up to the time of his last illness.

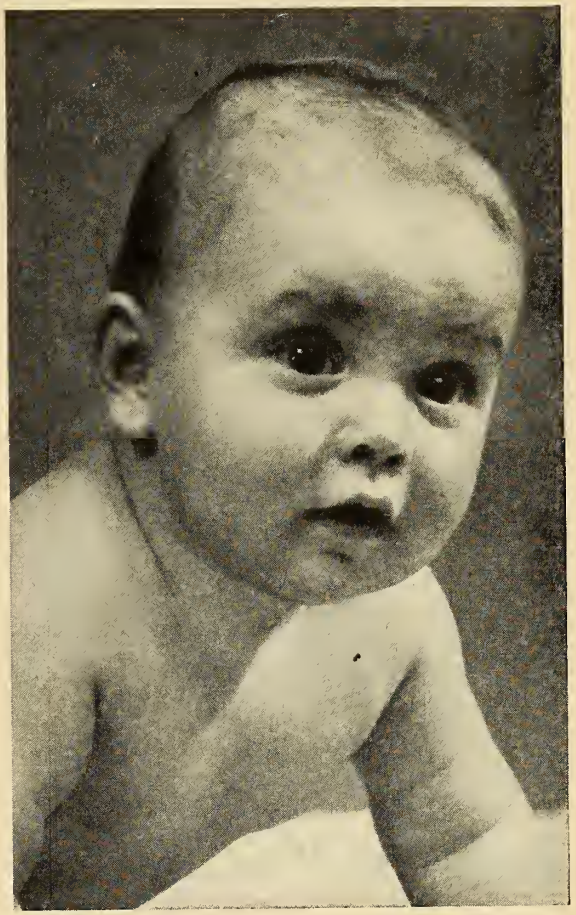
Dr. Butler was Assistant Professor of Dermatology at the University, a member of the Hennepin County Medical Society, the Minnesota Academy of Medicine, and the Dermatological and Urological Societies. He also belonged to the Minneapolis, the Minnekahda, the Lafayette and the University Clubs.

Dr. Butler's outstanding characteristics were his great capacity for friendship, his love of life and keen enjoyment of the society of those he cared for. Among the legion of his friends he leaves a place which can never be filled.

J. E. H.

SURGEON LIEUTENANT WILLIAM LYON MACKENZIE KING

Word has been received that Surgeon Lieutenant William Lyon Mackenzie King was lost at sea when the British destroyer St. Croix was torpedoed recently in the North Atlantic. Surgeon Lieutenant King, a nephew of Prime Minister Mackenzie King of Canada, was born at Ottawa, Ontario, Canada, January 2,



Nestlé's Milk Products world's first choice for babies!



No feeding directions furnished to the laity

1913. He received the degree of doctor of medicine from the University of Toronto in 1937 and was intern at Toronto General Hospital from July, 1937, to July, 1938. Thereafter, from July, 1938, to June, 1941, he was a fellow in surgery in the Mayo Foundation and received the degree of master of science in surgery from the University of Minnesota in June, 1941. Before he joined the Royal Canadian Navy in 1942, he was house surgeon at St. Michael's Hospital in Toronto. He is survived by his wife and two children, one of whom was born in Rochester.

CAPTAIN LESTER W. BAIRD

Word has come of the sudden death of Captain Lester W. Baird, M.C., A.U.S. Captain Baird was born at Edwardsville, Illinois, April 19, 1907. He received the degree of doctor of medicine from the University of Illinois in 1933 and was successively intern resident physician at the Santa Clara County Hospital, San Jose California. Thereafter, from 1934 to 1937, he was a fellow in radiology in the Mayo Foundation. Before he entered the army he was a member of the Scott and White Clinic, Temple, Texas. Captain Baird became chief of roentgenology at Camp Carson, Colorado, where he died of coronary occlusion on October 6.

SHORTENING CONVALESCENCE

Sick and wounded men of the Army Air Forces get well faster and go back to military duty in "top" physical condition as a result of the convalescent-rehabilitation training program in Air Forces hospitals, Brig. Gen. David N. W. Grant, the Air Surgeon, reported at the wartime conference of the American Public Health Association.

The program has been in operation for the past seven months, General Grant reported. During this time approximately 16,000,000 man-hours in physical and educational training have been given and the teaching rate at the present time is about 2,500,000 man-hours per month.

The sick soldiers are reconditioned physically by a planned and organized physical rehabilitation program. At the same time, the many hours of convalescence that are usually wasted are used for the educational program designed to disseminate knowledge and thereby make these men better soldiers. If the man cannot go back to military service, he is helped by this program to return to productive civilian life.—*Science News Letter,* October 23, 1943.

Aristotle, the ancient Greek philosopher, advised over 2,000 years ago the eating of liver to prevent *night blindness.*

Radiation Therapy Institute



Treatment Room

of Saint Paul

CHARLES T. MILLER HOSPITAL

Facilities for Radium and Roentgen Therapy, Including Million Volt Constant Potential Installation of Most Advanced Design.

You are cordially invited to visit the Radiation Therapy Institute and inspect its facilities

Edward Schons, M.D., *Director* J. P. Medelman, M.D., *Associate Director*

REPORTS and ANNOUNCEMENTS

WABASHA COUNTY MEDICAL SOCIETY

The seventy-fifth annual meeting of the Wabasha County Medical Society was held at Plainview, Minnesota, October 7, and was marked by a good attendance. The business session in the afternoon was followed by a dinner which was attended by twenty-six members, wives and guests.

At the evening session the President's Address was presented by Acting President, Dr. D. P. Dempsey Kellogg, President T. G. Wellman being absent in military service. Dr. Kellogg's subject was "Obstetrics." Dr. B. J. Terrell, Superintendent of Buena Vista Sanatorium, Wabasha, presented a paper on "Tuberculosis and Other Chest Conditions." Dr. E. C. Bayley of Lake City, delegate to the State Medical Association, gave a review of the proceedings of the ninetieth annual session of the House of Delegates. Dr. W. F. Braasch of Rochester, secretary of the National Physician's Committee, addressed the group on "What the County Medical Society Should Do." This was followed by a short talk on subjects relating to public health and sanitation by Dr. F. M. Feldman of Rochester, representing the State Board of Health, Third District.

Entertainment for the women guests was provided at the home of Dr. and Mrs. D. G. Mahle.

Officers elected for the coming year are:

President—Dr. E. C. Bayley, Lake City

Vice President—Dr. C. G. Ochsner, Wabasha

Secretary-Treasurer—Dr. W. F. Wilson, Lake City

Delegate to State Association—Dr. E. C. Bayley, Lake City

Alternate—Dr. E. W. Ellis, Elgin

Censor for three years—Dr. W. J. Cochrane, Lake City

Censors holding over—Dr. W. H. Replogle, Wabasha, and Dr. D. G. Mahle, Plainview.

WEST CENTRAL MEDICAL SOCIETY

The West Central Medical Society held its annual meeting in Morris, October 13, 1943. At the scientific session following dinner, Dr. Howard Johnson of Ortonville read a paper on "Penicillin" and Dr. Charles Bolsta discussed the present status of medical practice and prospective socialized medicine.

Election of officers resulted as follows:

President—W. C. Rydburg, Brooten

Vice President—B. W. Jarvis, Starbuck

Secretary-Treasurer—Herman Linde, Cyrus

Delegate to MSMA—F. W. Behmler, Morris

Alternate—Charles Bolsta, Ortonville.

Excellence in War Production



FOR supplying Mercurochrome and other drugs, diagnostic solutions and testing equipment required by the Armed Forces, for developing and producing Sterile Shaker Packages of Crystalline Sulfanilamide especially designed to meet military needs, and for completing deliveries ahead of contract schedule—these are the reasons for the Army-Navy "E" Award to our organization.

The effectiveness of Mercurochrome has been demonstrated by more than twenty years of extensive clinical use.

For the convenience of physicians Mercurochrome is supplied in four forms—Aqueous Solution for the treatment of wounds, Surgical Solution for preoperative skin disinfection, Tablets and Powder from which solutions of any desired concentration may readily be prepared.

Mercurochrome (H. W. & D Brand of dibrom-oxymercuri-fluorescein-sodium) is economical because stock solutions may be dispensed quickly and at low cost by the physician or in the dispensary. Stock solutions keep indefinitely. Literature furnished to physicians on request.



HYNSON, WESTCOTT & DUNNING, INC.
BALTIMORE, MARYLAND

Of General Interest

Dr. Charles W. More of Eveleth was guest of honor at a meeting of the Range Medical Society held in Eveleth, September 28.

* * *

According to information received from his family, Dr. J. K. Keeley, former fellow in the Mayo Foundation, is a prisoner of war in the Philippine Islands.

* * *

Dr. Oliver M. Porter, who practiced in Minnesota before going to Sisseton, South Dakota, several years ago, will return to this state this month, having opened offices in Willmar for the practice of general medicine.

* * *

Dr. Floyd Burns of Milan has been commissioned Lieutenant in the Medical Corps of the United States Navy and has reported for duty at the Great Lakes Naval Training Station.

* * *

Dr. A. F. Geis of Graceville has received his call for induction in the armed forces and will report for duty as soon as called. Dr. Geis had moved to Graceville from Minneapolis but ten days before he was notified that he was to serve his country. He is the most recent addition to the staff of the Oliver Clinic there.

Dr. E. A. Thayer of Truman reported for military duty at Salt Lake City, Utah, October 13. He is a First Lieutenant in the Medical Corps of the United States Army.

* * *

Dr. William Strunk of Northfield, director of health service at St. Olaf College, has received his commission as Captain in the Medical Corps and has reported for duty at Camp Custer, Michigan.

* * *

Dr. D. D. Rempel of Lester Prairie has purchased the equipment of the late Dr. A. R. Johnson of Isanti and has located in the office formerly used by Dr. Johnson, for the practice of medicine.

* * *

Dr. B. T. Bottolfson, physician and surgeon and former mayor of Moorhead, has been granted a fellowship at the Wills Eye Hospital, Philadelphia, where he is now engaged in study.

* * *

Dr. Edward M. Baldigo of Red Wing has reported for military duty at Carlisle Barracks, Pennsylvania, following which he will serve with the Eighth Headquarters Command, Medical Department, at Dallas, Texas. He has the commission of First Lieutenant.



REST HOSPITAL

A quiet, ethical hospital with therapeutic facilities for the diagnosis, care and treatment of Nervous and Medical cases. Invites coöperation of all reputable physicians who may supervise the treatment of their patients.

PSYCHIATRISTS IN CHARGE
Dr. Hewitt B. Hannah
Dr. Joel C. Hultkrans

2527 2nd Ave. S., Minneapolis, Phone At. 7369



The Birches Sanitarium, Inc.

2391 Woodland Avenue

Duluth, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Psychiatrists in Charge

L. R. Gowan, M.D. **A. S. Nissen, M.D.**

Dr. Gordon B. New of Rochester was elected president-elect at the annual meeting of the American Academy of Ophthalmology and Otolaryngology held in Chicago in October.

* * *

Dr. A. V. Stoesser of Minneapolis was the guest speaker at the regular meeting of the Scott-Carver Medical Society held in Shakopee, September 22. His subject was "Allergy in Pediatrics."

* * *

Dr. R. E. Johnson, assistant chief of staff of the Southwestern Minnesota Sanatorium at Worthington for the past six years, has resigned his post to take over the superintendency of Sunny Rest Sanatorium at Crookston.

* * *

Dr. Claude F. Dixon of Rochester gave the Arthur Dean Bevan Lecture at a meeting of the Chicago Surgical Society in Chicago, October 1. His subject was "Anterior Resection for Carcinoma Low in the Sigmoid and Rectosigmoid."

* * *

Dr. E. Graham Howard of Mapleton has been called into active service in the United States Navy and has reported to the Great Lakes Naval Training Station. He has the commission of Lieutenant in the Medical Corps.

* * *

"Malaria" was the subject of the address given at the regular meeting of the Minnesota Pathological Society by Dr. L. T. Coggeshall of Ann Arbor, Michigan, at the Medical Science Amphitheater on the University Campus, Minneapolis, October 19.

* * *

Dr. E. D. Risser of Winona has moved to Pasadena, California, where he will open offices and establish a practice. Dr. Risser came to Winona in 1921, being associated with the Winona Clinic five years before opening his own offices. He had been associated with Dr. G. L. Loomis since 1937.

* * *

The Wheaton Hospital, Wheaton, Minnesota, was closed on October 1 mainly because of the shortage of nurses, it was announced. Drs. C. F. Ewing and A. L. Lindberg will continue their general practice as before, but major operative cases will be taken elsewhere. The hospital was first opened by Dr. Ewing in 1904.

* * *

Installation of Dr. Thomas J. Kinsella as president of the Hennepin County Medical Society and the address of Dr. Willard D. White, retiring president, featured the annual meeting of the Hennepin County Medical Society, October 4. Dr. J. K. Anderson took office as vice president and Dr. A. E. Cardle as second vice president.

* * *

Subjects presented at the Interdepartmental Seminar on the University Campus, Wednesday evening, October 27, included "A Practical Clinical Test for Organic Brain Damage" by Dr. Howard F. Hunt, of the Depart-



Accident, Hospital, Sickness
INSURANCE
For ethical practitioners exclusively
(57,000 Policies in Force)

	For
$5,000.00 accidental death $25.00 weekly indemnity, accident and sickness	$32.00 per year
$10,000.00 accidental death $50.00 weekly, indemnity, accident and sickness	$64.00 per year
$15,000.00 accidental death $75.00 weekly indemnity, accident and sickness	$96.00 per year

ALSO HOSPITAL EXPENSE FOR MEMBERS, WIVES AND CHILDREN

41 Years Under the Same Management

$2,418,000.00 INVESTED ASSETS

$11,750,000.00 PAID FOR CLAIMS

$200,000 deposited with State of Nebraska for protection of our members.

Disability need not be incurred in line of duty—benefits from the beginning day of disability.

86c out of each $1.00 gross income used for members' benefit

PHYSICIANS CASUALTY ASSOCIATION
PHYSICIANS HEALTH ASSOCIATION
400 First National Bank Building OMAHA 2, NEBR.

ments of Neuropsychiatry and Psychology, and "The Effects of Retrograde Degeneration on Neurone Activity" by Dr. Berry Campbell of the Department of Anatomy.

* * *

Captain Alfred C. Meyer of the Army Medical Corps, former fellow in surgery in the Mayo Foundation, has been awarded the Silver Star for heroism and outstanding achievement in operating on wounded soldiers while under Japanese gunfire in New Guinea. It is reported that he is serving with the first portable hospital to be established by the Army.

* * *

The Soudan Hospital, owned and operated for the past nine years by Dr. C. Gordon Watson, has been sold to the Lenont-Peterson Clinic of Virginia and will be operated by the Clinic with Dr. Leslie Laikola as resident physician. The Soudan Hospital has been in continuous operation for the past fifty-five years, being the oldest hospital on any of the iron ranges. Dr. Watson is leaving to serve in the Navy and following the war plans to establish a practice in Minneapolis.

* * *

For outstanding work in the fight against tuberculosis, Dr. C. L. Sherman of Luverne received the Christmas Seal plaque from Dr. E. A. Meyerding, executive secretary of the Minnesota Public Health Association, at ceremonies held in Luverne, October 12. Dr. Sherman was instrumental in the founding of the Southwestern Minnesota Sanatorium and for the past twenty-eight years has served as president of the Sanatorium commission.

* * *

Dr. W. J. Cochrane of Lake City was elected president of the Lake City Bank and Trust Company at a meeting of the Board of Directors held October 11. Dr. Cochrane has long been associated with the Lake City Bank and Trust Company, having been a member of the Board of Directors since 1907 and vice president since 1931. Dr. Cochrane retired from active medical practice a year ago. He succeeds Mr. H. F. Johns, recently deceased, as president of the bank.

* * *

Dr. William W. Moir, former Stillwater physician, recently was awarded the distinguished service cross for his part in the Tunisian campaign. Although wounded in the head by a 20 mm. shell fragment and in the shoulder by machine gun fire from strafing airplanes, Dr. Moir, with the help of a sergeant and two company aid men, attended over twenty paratroopers injured when three American planes were shot down by enemy fighters. They stayed at their post twenty-four hours before being relieved.

* * *

Dr. A. B. Stewart of Owatonna, oldest physician and surgeon of Steele County, quietly observed his eightieth birthday at the Colonial Hospital, Rochester, where he was a patient at the time. He has since returned to



VOCATIONAL HOSPITAL

Director of Nurses—M. H. WOLTMAN, R.N., B.S.
Superintendent & Dietitian—H. B. BROWN, B.S.

. . . An integral part of the Miller Vocational High School offers two special features—Patients receive a maximum of personal attention from student practical nurses—All food is prepared under the direction of a qualified dietitian. Patients remain under the care of their own physicians.

Physicians may secure services of Vocational nurses by calling Nurses Headquarters and asking for a Vocational Nurse

Bridgeport 2281

5511 South Lyndale - - Minneapolis

DANIELSON MEDICAL ARTS PHARMACY, INC.

PHONES:
ATLANTIC 3317
ATLANTIC 3318

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

HOURS:
WEEK DAYS—8 to 7
SUN. AND HOL.—10 TO 1

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.
414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.
INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS
MAIN 2494

Owatonna, where he has lived for the past forty-two years. Dr. Stewart was born in Hume, New York, September 23, 1863, and was graduated from the University of Minnesota in 1891. He came to Owatonna that year to practice his profession. He is now retired from practice.

* * *

Dr. Walter P. Gardner, Superintendent of the Anoka State Hospital, Anoka, Minnesota, has resigned his post to return to private practice.

Upon his resignation, Dr. Gardner, former president of the Minnesota Hospital Association, and at present a clinical assistant professor of nervous and mental diseases at the University of Minnesota medical school, will become a partner of Dr. W. H. Hengstler of Saint Paul, who is also a specialist in nervous and mental diseases.

During his administration at the Anoka State Hospital, which has 14,000 patients, Dr. Gardner made a number of improvements for the care of patients in the institution.

* * *

Dr. G. A. Hedberg, formerly Assistant Medical Director of Nopeming Sanatorium, was appointed Superintendent and Medical Director on July 1, 1943, succeeding Dr. A. T. Laird, who retired on that date to enter private practice in Duluth.

There's Only ONE

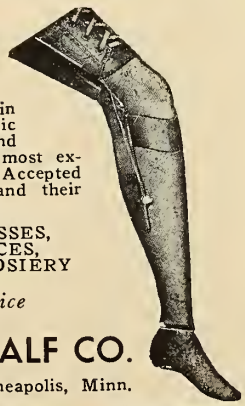


For 16 years this simplified, single-volume office record book has saved precious time for busy doctors. It was designed by a practicing physician—has been perfected by usage—now provides an ideal bookkeeping system for pay-as-you-go tax reporting. Examine a copy for yourself, or write for fully explanatory literature. $6.00.

DAILY LOG

COLWELL PUBLISHING CO. 226 University Ave. Champaign, Ill.

SKILL & CARE!



Combine with quality materials in all Buchstein-Medcalf orthopedic appliances. Our workmanship and scientific design conform to the most exacting professional specifications. Accepted and appreciated by physicians and their patients for more than 45 years.

ARTIFICIAL LIMBS, TRUSSES, ORTHOPEDIC APPLIANCES, SUPPORTERS, ELASTIC HOSIERY

Prompt, painstaking service

BUCHSTEIN-MEDCALF CO.

610-3rd Ave. South Minneapolis, Minn.

PROFESSIONAL PROTECTION

SINCE 1899 SPECIALIZED SERVICE

In addition to our Professional Liability Policy for private practice we issue a special

MILITARY POLICY

to the profession in the Armed Forces at a

REDUCED PREMIUM

THE MEDICAL PROTECTIVE COMPANY

OF

FORT WAYNE, INDIANA

Cook County Graduate School of Medicine

(In Affiliation with Cook County Hospital)

Incorporated not for profit

ANNOUNCES CONTINUOUS COURSES

SURGERY—Two Weeks' Intensive Course in Surgical Technique starting November 1st, 15th, and 29th, and every two weeks throughout the year.

MEDICINE—Courses to be announced in January.

FRACTURES & TRAUMATIC SURGERY—Courses to be announced in January.

GYNECOLOGY—Two Weeks' Intensive course starting February 7th. One-Week Personal Course in Vaginal Approach to Pelvic Surgery starting November 1st. Clinical and Diagnostic Courses.

OBSTETRICS—Two Weeks' Intensive Course starting February 21st.

ANESTHESIA—One-Week Course in Continuous Caudal Anesthesia for Obstetrics.

OPHTHALMOLOGY—Clinical Course.

OTOLARYNGOLOGY—Special and Clinical Courses.

ROENTGENOLOGY—Courses in X-Ray Interpretation, Fluoroscopy, Deep X-Ray Therapy every week.

UROLOGY—Two Weeks' Course and One-Month Course available every two weeks.

CYSTOSCOPY—Ten-Day Practical Course every two weeks.

General, Intensive and Special Courses in All Branches of Medicine, Surgery and the Specialties.

TEACHING FACULTY — ATTENDING STAFF OF COOK COUNTY HOSPITAL

Address:

Registrar, 427 S. Honore St., Chicago 12, Ill.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

AN INTRODUCTION TO MEDICAL MYCOLOGY. George M. Lewis, M.D. Member of American Dermatological Association, Inc.; Fellow American College of Physicians, American Medical Association and New York Academy of Medicine, etc.; and Mary E. Hopper, M.S., Research Fellow in Medicine, Cornell University Medical School. 342 pages. Illus. Price, $6.50, cloth. Chicago: The Year Book Publishers, 1943.

NERVOUSNESS, INDIGESTION AND PAIN. Walter C. Alvarez, M.D. Professor of Medicine, University of Minnesota (Mayo Foundation); Consultant in the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. 488 pages. Price, $5.00, cloth. New York: Paul B. Hoeber, Inc., 1943.

THE COMPLEAT PEDIATRICIAN. Fourth Edition. Wilburt C. Davison, M.A., D.Sc., M.D. Professor of Pediatrics, Duke University School of Medicine, and Pediatrician, Duke Hospital, formerly Acting Dean of Department of Pediatrics, The Johns Hopkins University School of Medicine; Acting Pediatrician in Charge, The Johns Hopkins Hospital, Member American Board of Pediatrics, etc. 256 pages and Index. Price, $4.00, cloth. Durham, N. C.: Duke University Press, 1943.

THE MIND OF THE INJURED MAN. Joseph L. Fetterman, M.A., M.D. Assistant Clinical Professor of Nervous Diseases, Western Reserve University School of Medicine, Cleveland, Ohio. 260 pages. Illus. Price, $4.00, cloth. Chicago: Industrial Medicine Book Co., 1943.

TEXTBOOK OF PHYSIOLOGY. Eighth Edition. William D. Zoethout, Ph.D., Professor of Physiology in the Chicago College of Dental Surgery (Loyola University) and W. W. Tuttle, Ph.D., Professor of Physiology, College of Medicine, State University of Iowa. 728 pages. Illus. Price, $4.75, cloth. St. Louis: C. V. Mosby Co., 1943.

ORTHOPEDIC NURSING. Robert V. Funsten, M.D., Professor of Orthopedic Surgery, University of Virginia Medical School and University of Virginia Hospital School of Nursing, Charlottesville, Virginia; and Carmelita Calderwood, R.N., A.B., Consultant

(Continued on Page 1022)

Now Available

BIOLOGICAL REFRIGERATOR

Priorities for the manufacture of the "Victory Model" biological refrigerator have been granted in order to supply the demand for this compact, efficient, and thoroughly useful piece of equipment.

Essential in storage and preservation of biologicals, pharmaceutical products, and laboratory preparations requiring refrigerated temperatures.

For further information ask our salesman or write us for full details and descriptive literature.

BROWN & DAY, INC.
ST. PAUL, MINN.

Complete Optical Service
LENS GRINDING
DISPENSING
CONTACT LENSES
EYE PHOTOGRAPHY

N. P. Benson Optical Co., Inc.
Established 1913
Main Office: Minneapolis, Minn.
— BRANCHES —
Aberdeen - Duluth - Eau Claire - Winona
Bismarck - La Crosse - Wausau - Stevens Point
Albert Lea - Rapid City



Largest Orthopedic Manufacturers in the Northwest
SPECIALISTS!
Extension Shoes and Clubfoot Corrections . . . Abdominal and Arch Supports . . . Braces for Deformities . . . Elastic Stockings . . . Expert Truss Fitters . . .

Seelert Orthopedic Appliance Company
88 South 9th Street
Minneapolis MAin 1768



Glenwood Hills Hospitals

One of the Views

●

Operated in Connection with Homewood Hospital

Plymouth at Penn Avenue, Minneapolis

●

3501 Golden Valley Road
Hyland Station
Route Seven

FOR THE TREATMENT OF NON-SURGICAL AND NON-INFECTIOUS DISEASES—A modern hospital built on the cottage plan. The buildings are located on elevated land, affording beautiful views on all sides. Glenwood Hills Hospitals have all the advantages of rural surroundings, and are still only a few minutes by automobile from the Minneapolis loop.

AN INVITATION—The facilities of these institutions are available for all reputable members of the medical profession.



HOMEWOOD HOSPITAL is one of the Northwest's outstanding hospitals for the treatment of Nervous Disorders—equipped with all the essentials for rendering high grade service to patient and physician.

Operated in Connection with Glenwood Hills Hospitals

HOMEWOOD HOSPITAL

Corner Penn and Plymouth Avenues North
Minneapolis **Minnesota**

Social and Educational Adjustment

for exceptional children of all ages. Visit the school noted for its work in educational development and fitting such children for more normal living. Beautiful grounds. Home atmosphere. Separate buildings for boys and girls.

Catalog by request.

The MARY E. POGUE SCHOOL

124 GENEVA ROAD **WHEATON, ILL.**
(NEAR CHICAGO)

Send us your slow collection items.

All accounts made by personal calls.

We specialize in Medical and Dental Accounts.

Bonded and Licensed Under Minnesota State Laws

Northwestern Adjustment Co.

518 Bremer Arcade Bldg.
St. Paul **Minnesota**

in Orthopedic Nursing, National League of Nursing Education, New York; formerly Supervisor, Orthopedic Service, Iowa University Hospital, Iowa City, Iowa. Formerly Clinical Instructor in Orthopedic Nursing, Children's Hospital, Denver, Colorado. 602 pages. Illus. Price, $3.75, cloth. St. Louis: C. V. Mosby Co., 1943.

PERSONAL AND COMMUNITY HEALTH. Seventh Edition. C. E. Turner, A.M., Sc.D., Dr.P.H. Professor of Public Health in the Massachusetts Institute of Technology; formerly Associate Professor of Hygiene in the Tufts College Medical and Dental Schools; sometime member of the Administrative Board in the School of Public Health of Harvard University and the Massachusetts Institute of Technology. 585 pages. Illus. Price, $3.50, cloth. St. Louis: C. V. Mosby Co., 1943.

CLINICAL LABORATORY METHODS AND DIAGNOSIS. Third Edition. 2 Vols. R. B. H. Gradwohl, M.D., D.Sc. Dir. of Gradwohl Laboratories and Gradwohl School of Laboratory Technique; formerly Director of Laboratories, St. Louis County Hospital; pathologist to Christian Hospital; Director, Research Laboratory, St. Louis Metropolitan Police Department, St. Louis, Mo.; Commander, Medical Corps, United States Naval Reserve, ret. 2130 pages, Index 100 pages. Illus. Price, $20.00, cloth. St. Louis: C. V. Mosby Co., 1943.

DR. COLWELL'S DAILY LOG. Champaign, Illinois, Colwell Publishing Company, 1944. Price $6.00.

Many physicians throughout the country have found this volume in years past of inestimable value, not alone as a day book but as a complete record of office and personal income and expense. Spaces are supplied for deductible office and professional expense items, auto upkeep, taxes, interest paid, and collection fees, and pages have been added for recording quarterly Social Security deductions as well as other taxes, contributions, obstetrical cases, et cetera. As a matter of fact, this volume, in conjunction with a ledger, constitutes a complete financial record.

ATLAS OF OBSTETRIC TECHNIQUE. By Paul Titus, M.D., Obstetrician and Gynecologist, St. Margaret Memorial Hospital, Pittsburgh. 180 pages. Illus. Price $7.00. St. Louis: C. V. Mosby Company, 1943.

This book follows the modern trend in literature, that is, illustrations compose the greater part of the book, with a minimum of word description. Obviously, therefore, no discussion of indications for the various procedures appears. This would indicate that the book must be supplemented by a standard text.

A good part of the book is taken up by nonobstetrical material such as sterility studies and abdominal surgical procedures which might be carried on during pregnancy. These include such procedures as appendectomy, removal of ovarian cysts, et cetera.

Section IV on Version and Breech Delivery contains the best sequence of illustrations. One section illustrates various post-partum procedures such as sterilization operations, breast abscess and cautery of the cervix. On the whole, the illustrations are clear and concise. However, in a subject as varied and unstereotyped as obstetrics, only a partial picture can be obtained by this type of book.

S. C. Mueller, M.D.

CLASSIFIED ADVERTISING

WANTED—A mobile shockproof x-ray with accessories, suitable for office use. In reply please state price, type of unit, et cetera. Address Minnesota Medicine, Box D-63.

POSITION WANTED—Receptionist and office secretary desires position in Twin Cities area, Saint Paul preferred. Excellent references. Telephone Garfield 8282 (Saint Paul).

FOR RENT—In suburban Saint Paul—1410 White Bear Avenue—physician's and dentist's offices with connecting reception room. Air conditioned and heated. Rent reasonable. Address C. Jensen, 1657 Minnehaha Avenue, Saint Paul, Minnesota.

FOR SALE—Current model Burdick Triplex short wave diathermy machine. Excellent condition. Has had home use only. Address Mrs. R. V. Arnold, 4032 Pleasant Avenue, Minneapolis, Minn.

PHYSICIAN WANTED—To assist in general practice. Salary or commission. Address D-62, care Minnesota Medicine.

FOR SALE—McIntosh Diathermy in good condition. May be seen at 580 Portland Avenue, Saint Paul. Telephone DAle 1792.

ZEMMER

PRESCRIBE or DISPENSE ZEMMER PHARMACEUTICALS

Tablets, Lozenges, Ampoules, Capsules, Ointments, etc. Guaranteed reliable potency. Our products are laboratory controlled. Write for catalogue.

Chemists to the Medical Profession MIN 11-43

THE ZEMMER COMPANY • Oakland Station • Pittsburgh 13, Pennsylvania

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.
414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.
INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS
MAIN 2494

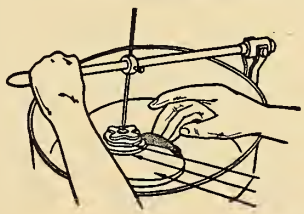
SAVE TIME!
TRY DAHL'S FIRST
Biologicals — Dressings
Pharmaceuticals — Surgical Instruments
Hypodermic Medications — Trusses
7:30 a.m. to 11 p.m.
Holidays, 9 a.m. to 11 p.m.
Joseph E. Dahl Co.
Incorporated
ATlantic 5445 — 82 So. 9th St., Mpls.

Radiological and Clinical
Assistance to Physicians
in this territory
MURPHY LABORATORIES
Minneapolis: 612 Wesley Temple Bldg. - - At. 4786
St. Paul: 348 Hamm Bldg. - - - - - - Ce. 7125
If no answer, call - - - - - - - - - - Ne. 1291


Orthopedic Braces and Appliances
Physicians' specifications followed precisely.
Scientific manufacture and fitting.
AUGUST F. KROLL
Manufacturer
230 WEST KELLOGG BLVD.
St. Paul, Minn. CE. 5330

Hall & Anderson
PRESCRIPTION PHARMACY
BIOLOGICALS
PHYSICIANS' SUPPLIES
SAINT PAUL, MINN.
LOWRY MEDICAL ARTS BUILDING
TELEPHONE: CEDAR 2735

★ V ★ V ★ ★ V ★ V ★
V For a Quick Victory
Do more than your share in this month's
VICTORY BOND DRIVE
Ask us for information regarding our various
AMERICAN WAY SERVICES
THE AMERICAN NATIONAL BANK
BREMER ARCADE 7TH AT ROBERT — *Free Parking* — *Member Federal Deposit Insurance Corporation*
Cedar 0573
★ V ★ V ★ ★ V ★ V ★

UNUSUAL LENS GRINDING

CATARACT, MYO-THIN and other difficult and complicated lenses are ground to extreme thinness and accuracy by our expert workmen.
ARTHUR F. WILLIAMS
SAINT PAUL
MINNESOTA

Save 25 to 40 Per Cent
Druggists' Mutual Insurance Company
OF IOWA, ALGONA, IOWA
Fire - Tornado - Automobile Insurance
Prompt Loss Service
Minneapolis Branch—S. E. STRUBLE, 835 Palace Bldg.
Home Office—Algona, Iowa



From Mother to Daughter . . .

The secret of stag horn shavings is the heritage of the women of the Cora tribe. By swallowing these scrapings, the squaw believes herself protected from pregnancy.*

● Physicians today know the medical necessity of child-spacing. Studies by prominent medical authorities prove that it is essential to infant and maternal health. Years of laboratory and clinic tests have demonstrated the effectiveness of Ortho-Gynol Vaginal Jelly. Because it is non-irritating, non-toxic and well-tolerated in continued use, it is more widely prescribed by physicians than any other preparation of its kind.

*Himes, *Medical History of Contraception*

ACCEPTED AMERICAN MEDICAL ASSN Council on Pharmacy and Chemistry

ortho-gynol
VAGINAL JELLY

COPYRIGHT 1943. ORTHO PRODUCTS, INC., LINDEN, N. J.

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 **December, 1943** **No. 12**

Contents

FEEDING THE CHILD.
R. E. Nutting, M.D., Duluth, Minnesota.....1039

PREPARING THE CHILD FOR SCHOOL.
Jeannette Baker, M.D., Fergus Falls, Minnesota..1041

EMOTIONAL DISTURBANCES OF CHILDREN IN WARTIME.
Henry F. Helmholz, M.D., Rochester, Minnesota..1044

CARCINOMA OF THE LUNG.
Herman J. Moersch, M.D., and *William S. Tinney, M.D.,* Rochester, Minnesota.....1046

USE OF CURARE IN METRAZOL TREATMENT OF PSYCHOSES.
E. W. Miller, M.D., Saint Peter, Minnesota....1052

THE DISCOVERY OF THE PULMONARY CIRCULATION OF THE BLOOD.
Max Neuburger, Vienna, Austria.....1054

PLASMA AND SERUM TOXICITY DUE TO A AND B SUBSTANCES.
Milton Gjelhaug Levine, M.S., Ph.D., Chicago, Illinois, and *David State, M.D.,* Minneapolis, Minnesota 1056

PROBLEMS ENCOUNTERED IN EXPLAINING CERTAIN CASES OF ERYTHROBLASTOSIS FETALIS ON THE Rh THEORY.
Ambrose J. Hertzog, M.D., Ph.D., Minneapolis, Minnesota 1057

CLINICAL PATHOLOGICAL CONFERENCE:
Presentation of a Case.
A. J. Hertzog, M.D., and *S. V. Lofsness, M.D.*..1060

CASE REPORTS:
Successful Treatment of Extreme Allergy to Bee Body and Bee Venom.
Evelyn G. McLane, A.B., M.D., Jackson, Minnesota 1061

Common Duct Repair by Means of Vitallium Tube.
James M. Hayes, M.D., Minneapolis, Minnesota 1064

Reinfection with Pneumococcus Meningitis.
Herbert I. Arbeiter, M.D., and *Milton Gjelhaug Levine, M.S., Ph.D.,* Chicago, Illinois.....1065

HISTORY OF MEDICINE IN MINNESOTA:
History of Medicine in Dodge County.
James Eckman, Rochester, Minnesota, and *Charles E. Bigelow, M.D.,* Dodge Center, Minnesota (Continued from November issue) 1067

PRESIDENT'S LETTER 1076

EDITORIAL:
Penicillin 1077
Neuburger—The Medical Historian.....1078
Ertron 1079
Medical Curricula 1079
Hospital Insurance 1080
American Medical Association—Council on Medical Service and Public Relations—A Statement of General Policies.....1080
Minnesota Evaluation Serology Study.....1081

MEDICAL ECONOMICS:
Challenge to Medicine.....1083
Minnesota State Board of Medical Examiners..1085
Physicians Licensed November 5, 1943.....1086

COMMUNICATIONS 1087

IN MEMORIAM 1089

MINNEAPOLIS SURGICAL SOCIETY:
Meeting of October 7, 1943.....1091
Injuries of the Urinary Tract.
Theodore H. Sweetser, M.D., Minneapolis, Minnesota 1091
Hyperparathyroid Disease Due to Tumor of the Parathyroid.
Carl O. Rice, M.D., Minneapolis, Minnesota..1092
Soap and Water Preparation of Lacerated Wounds.
R. C. Webb, M.D., Minneapolis, Minnesota..1093

MINNESOTA ACADEMY OF MEDICINE:
Meeting of October 13, 1943.....1097
Roentgenologic Observation on Bronchial Occlusion. (Abstract.)
Leo Rigler, M.D., Minneapolis, Minnesota....1097

REPORTS AND ANNOUNCEMENTS.....1098
WOMAN'S AUXILIARY.....1100
OF GENERAL INTEREST.....1102
BOOK REVIEWS 1104
INDEX TO VOLUME 26.....1111

Contents of MINNESOTA MEDICINE copyrighted by Minnesota State Medical Association, 1943

Entered at the Post Office in Minneapolis as second class mail matter. Accepted for mailing at the special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 13, 1918.

MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL ASSOCIATION

Published by the Association under the direction of its Editing and Publishing Committee

EDITING AND PUBLISHING COMMITTEE

E. M. HAMMES, Saint Paul
PHILIP F. DONOHUE, Saint Paul
H. W. MEYERDING, Rochester
H. A. ROUST, Montevideo
B. O. MORK, JR., Worthington
A. H. WELLS, Duluth
O. W. ROWE, Duluth
T. A. PEPPARD, Minneapolis
HENRY L. ULRICH, Minneapolis
C. L. OPPEGAARD, Crookston

EDITORIAL STAFF

CARL B. DRAKE, Saint Paul, Editor
GEORGE EARL, Saint Paul, Associate Editor
HENRY L. ULRICH, Minneapolis, Associate Editor

BUSINESS MANAGER

J. R. BRUCE

Annual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian Subscriptions—$3.50.

The right is reserved to reject material submitted for editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

Classified advertising—five cents a word; minimum charge, $1.00. Remittance should accompany order.

Display advertising rates on request.

Address all communications to Minnesota Medicine, 2642 University Avenue, Saint Paul, or National Bldg., Minneapolis. Telephone Nestor 2641.

ST. CROIXDALE ON LAKE ST. CROIX

PRESCOTT, WISCONSIN



MAIN BUILDING—ONE OF THE 5 UNITS IN "COTTAGE PLAN"

A Modern Private Sanitarium for the Diagnosis, Care and Treatment of Nervous, Mental and Medical Cases

Located on beautiful Lake St. Croix, eighteen miles from the Twin Cities, it has the advantages of both City and County. Every facility for treatment provided, including recreational activities and occupational therapy under trained personnel. Milk, cream and butter from our own herd of Tuberculin-tested Registered Guernsey Cows. Inspection and coöperation by reputable physicians invited. Rates very reasonable. Illustrated folder on request.

CONSULTING NEURO-PSYCHIATRISTS

Hewitt B. Hannah, M.D.
Joel C. Hultkrans, M.D.
511 Medical Arts Building
Minneapolis, Minnesota
Tel. MAin 4672

RESIDENT PHYSICIAN
Howard J. Laney, M.D.
Prescott, Wisconsin
Tel. 39

SUPERINTENDENT
Ella M. Mackie
Prescott, Wisconsin
Tel. 69



SURGERY UNDER SIEGE!





Steady hands, unwavering eyes . . . he needs them now. Never mind the bombs and shrapnel. Every case an "emergency" . . . an endless strain, a withering grind. But today's army field surgeon can take it. Like the men at the guns he seldom relaxes, but when he does, you can be sure he appreciates a cheering smoke.

Add to his cheer. Send a carton of Camels . . . a token of your personal appreciation for his sacrifices. Remember—Camel is first choice in the armed forces* . . . for mildness, better taste. See your dealer today.

1st in the Service

*With men in the Army, Navy, Marine Corps, and Coast Guard, the favorite cigarette is Camel. (Based on actual sales records.)



Camel

costlier tobaccos

New reprint available on cigarette research—Archives of Otolaryngology, March, 1943, pp. 404-410. Camel Cigarettes, Medical Relations Division, One Pershing Square, New York 17, N. Y.

a Poor Scholar . . . because of a Poor Breakfast

MANY a child is scolded for dullness when he should be treated for undernourishment. In hundreds of homes a "continental" breakfast of a roll and coffee is the rule. If, day after day, a child breaks the night's fast of twelve hours on this scant fare, — or less — small wonder that he is listless, nervous, or stupid at school.

Pablum offers a happy solution to the problem of the school-child's breakfast. Mothers who learn about Pablum from their physicians are delighted to serve it, for it needs no cooking and can be prepared in a minute at the table — more quickly than many less nourishing foods. Right now, this feature is especially valuable in homes where the mother is engaged in war work. Pablum not only ends the bane of long cooking of cereals but in addition furnishes a variety of minerals (calcium, phosphorus, and iron) and the vitamin B complex. It is an excellent vehicle for milk.

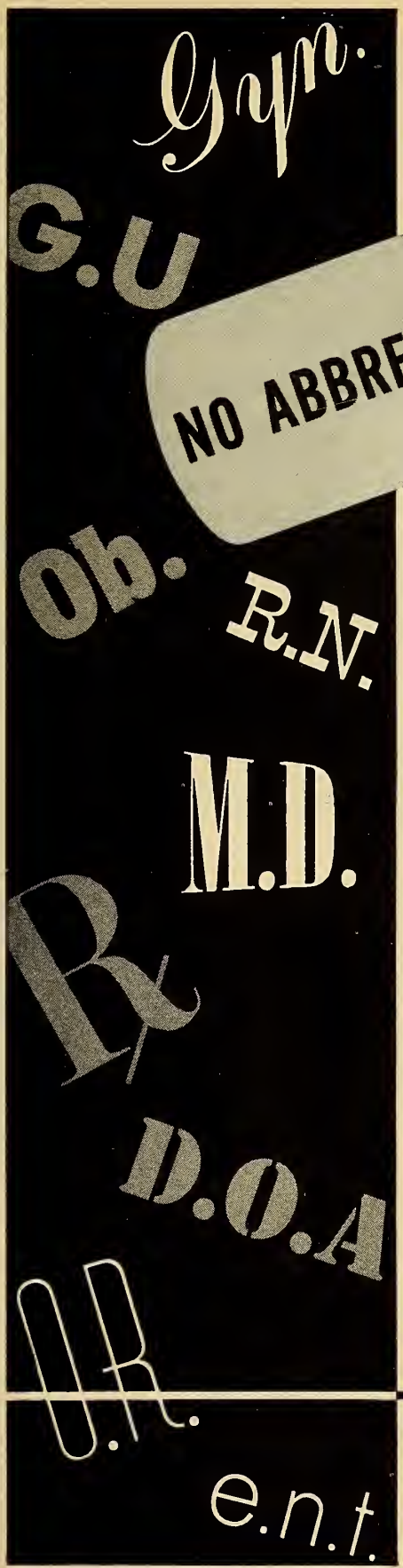
PABLUM is rich in calcium and iron, minerals likely to be deficient in the school-child's diet yet needed in more than average amounts during childhood. Numerous clinical studies have demonstrated that Pablum gives good weight gains and increases hemoglobin values in both normal and sick infants and children. Reprints on request of physicians.

Pablum (Mead's Cereal thoroughly cooked) is a palatable cereal enriched with vitamin- and mineral-containing foods, consisting of wheatmeal, oatmeal, wheat embryo, cornmeal, beef bone, alfalfa leaf, brewers' yeast, sodium chloride and reduced iron. (The oatmeal form of Pablum is called Pabena.)
MEAD JOHNSON & COMPANY, EVANSVILLE 21, IND., U.S.A.





"TOMMY, that's the third time this week you haven't learned your lesson. Why don't you listen to me when I tell you how to work the problems?"



NO ABBREVIATION FOR PITUITRIN!

While abbreviations may save time, physicians who say "an ampoule of Pit" are never sure of getting PITUITRIN*. When PITUITRIN is specified by *its full name* medical men receive the original preparation of its kind, first offered to the profession by Parke, Davis & Company in 1909.

PITUITRIN contains an unusually low percentage of inert or irritating matter and will not deteriorate over long periods of time. Since an excess of acid is not required as a preservative, injection is practically painless.

Clinical results, based on millions of injections, have made PITUITRIN (brand of posterior pituitary injection—U.S.P.) specific for all prepartum and postpartum uses.

*TRADE-MARK REG. U. S. PAT. OFF.

PITUITRIN

PARKE, DAVIS & COMPANY

DETROIT • MICHIGAN



... they still are women

WHATEVER part in the war effort women elect for themselves, they still face certain physiologic upsets peculiar to their sex. Many of these gynecologic disorders are referable to ovarian or hypophyseal dysfunction.

Where estrogenic hormone is indicated, most economical specific therapy is obtained by oral administration of diethylstilbestrol, generally in total daily dosage of one milligram and often less.

For physicians who prefer *natural* estrogenic substance, Amniotin is available in dosage forms for oral, hypodermic and intravaginal administration.

E. R. Squibb & Sons has a most extensive line of Council-Accepted endocrine products. Much that is known of modern endocrine therapy was learned through the cooperative studies with leading independent endocrinologists which the Squibb Laboratories made possible.

When estrogens are needed why not specify Amniotin or Diethylstilbestrol Squibb?

For literature address the Professional Service Dept., 745 Fifth Avenue, New York 22, N. Y.

★ BUY MORE WAR BONDS ★

E·R·SQUIBB & SONS

Manufacturing Chemists to the Medical Profession since 1858

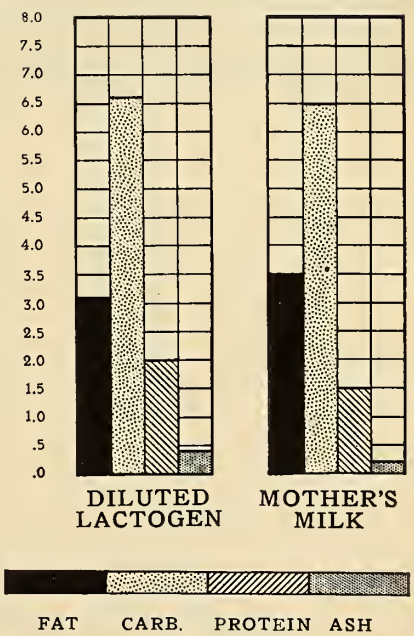




LACTOGEN

approximates women's milk in the proportion of food substances

THE cows' milk used for Lactogen is scientifically modified for infant feeding. This modification is effected by the addition of milk fat and milk sugar in definite proportions. When Lactogen is properly diluted with water it results in a formula containing the food substances—fat, carbohydrate, protein, and ash—in approximately the same proportion as they exist in women's milk.



No advertising or feeding directions, except to physicians. For feeding directions and prescription blanks, send your professional blank to "Lactogen Department," Nestlé's Milk Products, Inc., 155 East 44th St., New York, N. Y.

"My own belief is, as already stated, that the average well baby thrives best on artificial foods in which the relations of the fat, sugar, and protein in the mixture are similar to those in human milk."

John Lovett Morse, A.M., M.D.
Clinical Pediatrics, p. 156.

NESTLÉ'S MILK PRODUCTS, INC.

155 EAST 44TH ST., NEW YORK, N. Y.



"Always tired" is a common enough complaint, but when accompanied by markedly low resistance to infections, low muscular tone and vascular weakness, by mental apathy and depression, the cause may be adrenal cortical insufficiency.

ADRENAL CORTEX EXTRACT (UPJOHN) offers potent replacement therapy with which to combat this syndrome. So carefully are the active steroids extracted to make this *natural* complex, so pure is the final cortical extract, that there is practically no trace of epinephrine, the hormone of the adrenal medulla.

Upjohn pioneering and research have resulted in the potent, reliable preparation many physicians use when a characteristic "syndrome of lowness" points to adrenal cortical insufficiency.

Adrenal Cortex Extract (Upjohn)

Sterile solution in 10 cc. rubber-capped vials for subcutaneous, intramuscular and intravenous therapy

Upjohn
KALAMAZOO MICHIGAN

ANOTHER WAY TO SAVE LIVES . . . BUY WAR BONDS FOR VICTORY



Is there any help for an overworked doctor?

YES—BIOLAC, because it saves you valuable time. It's a complete infant formula and there are no extra ingredients to calculate.

Biolac provides completely for all nutritional needs of the young infant except vitamin C.

Prescribe Biolac routinely to reduce the possibility of errors and contamination in formula preparation. It requires only simple dilution with boiled water . . . as you prescribe.

NO LACK IN BIOLAC

Borden's complete infant formula

● *Biolac is prepared from whole milk, skim milk, lactose, Vitamin B_1, concentrate of Vitamins A and D from cod liver oil, and ferric citrate. It is evaporated, homogenized, and* sterilized. *For professional information, write Borden's Prescription Products Division, 350 Madison Avenue, New York City.*

ACCEPTED MEDICAL ASSN.

28 WORDS
tell the story . . .

Clinical tests* showed that when smokers changed to PHILIP MORRIS Cigarettes, every case of irritation of the nose and throat due to smoking cleared completely or definitely improved.

*Laryngoscope, Feb. 1935, Vol. XLV, No. 2—149-154.

TO THE PHYSICIAN WHO SMOKES A PIPE: We suggest an unusually fine new blend — COUNTRY DOCTOR PIPE MIXTURE. Made by the same process as used in the manufacture of Philip Morris Cigarettes.

Now Available

FOR ORAL USE

There has long been a real need for a potent, mercurial diuretic compound which would be effective by mouth. Such a preparation serves not only as an adjunct to parenteral therapy but is very useful when injections can not be given.

After the oral administration of Salyrgan-Theophylline tablets a satisfactory diuretic response is obtained in a high percentage of cases. However, the results after intravenous or intramuscular injection of Salyrgan-Theophylline solution are more consistent.

Salyrgan-Theophylline is supplied in two forms:

Tablets (enteric coated) in bottles of 25, 100 and 500. Each tablet contains 0.08 Gm. Salyrgan and 0.04 Gm. theophylline.

Solution in ampuls of 1 cc., boxes of 5, 25 and 100; ampuls of 2 cc., boxes of 10, 25 and 100.

Write for literature

ACCEPTED AMERICAN MEDICAL ASSN. Council on Pharmacy and Chemistry

SALYRGAN-THEOPHYLLINE

"Salyrgan," trademark Reg. U. S. Pat. Off. & Canada

Brand of **MERSALYL with THEOPHYLLINE**

ARMY E NAVY

WINTHROP CHEMICAL COMPANY, INC.

Pharmaceuticals of merit for the physician

NEW YORK 13, N. Y. WINDSOR, ONT.

WINTHROP

PYOKTANIN SURGICAL GUT

Plain and Formalized

Manufactured Since 1899 by

The Laboratory of the Ramsey County Medical Society

Packaged dry in hermetically sealed glass tubes in accordance with the new requirements of the U. S. Pharmacopœia.

• • •

Price List

PLAIN TYPE A NONBOILABLE
AND
FORMALIZED TYPE C NONBOILABLE

Sizes.....000 — 00 — 0 — 1 — 2 — 3
28 inches.....per dozen strands $2.00
60 inches.....per dozen strands $3.00

Special discount to hospitals and to the trade. Cash must accompany the order.

• • •

Address

LABORATORY RAMSEY COUNTY MEDICAL SOCIETY

Lowry Medical Arts Building, St. Paul, Minnesota

FOR SALE BY SURGICAL DEALERS AND DRUGGISTS

The increasing span of usefulness for

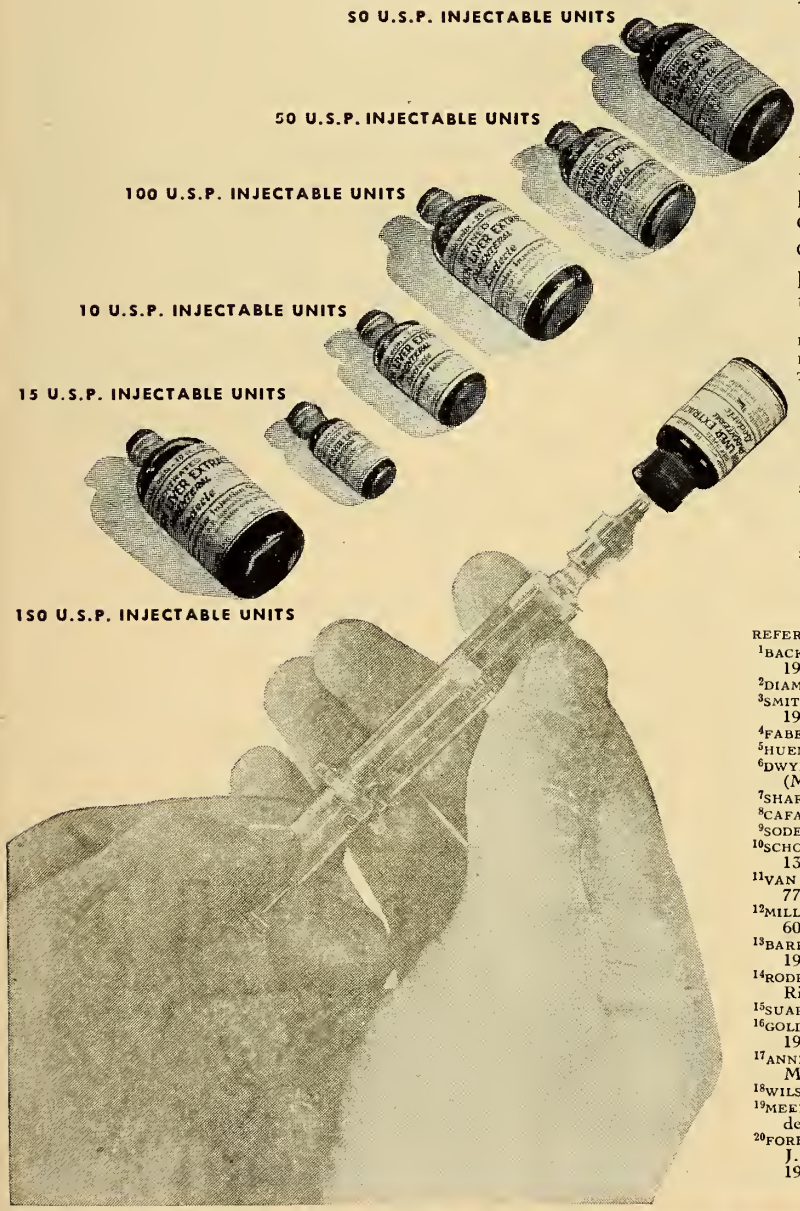
LIVER EXTRACTS

Lederle

LIVER SOLUTIONS today approach perfection so closely that unpleasant reactions following their injection rarely occur. This product excellence has encouraged widespread clinical trial for conditions other than pernicious anemia. These trials now clearly indicate the parenteral use of concentrated liver extracts in the following conditions:

- Macrocytic hyperchromic anemia of infancy 1, 2, 3, 4, 5, 6.
- Macrocytic anemias of pregnancy 7, 8, 9
- Sprue 10, 11, 12, 13, 14, 15.
- Anemia associated with Hepatic insufficiency 16, 17, 18, 19, 20.

It is believed that further trial of parenteral liver extracts in these conditions, in addition to all the other measures indicated, will prove a valuable addition to therapy.



PACKAGES:

REFINED SOLUTION LIVER EXTRACT (PARENTERAL) U. S. P. XII
- 1—10 cc. vial (5 U. S. P. injectable units per cc.)
- 1—5 cc. vial (10 U. S. P. injectable units per cc.)
- 1—10 cc. vial (10 U. S. P. injectable units per cc.)

SOLUTION LIVER EXTRACT (PARENTERAL) U. S. P. XII
- 3—3 cc. vials (10 U. S. P. injectable units each)

SOLUTION LIVER EXTRACT CONCENTRATED (PARENTERAL) U. S. P. XII
- 3—1 cc. vials (15 U. S. P. units each)
- 1—10 cc. vial (150 U. S. P. units)

REFERENCES:

[1]BACKMAN, A. L.: Am. J. Dis. Child. 52:633 (Sept.) 1936.
[2]DIAMOND, L. K.: J. Pediat. 13:143 (July) 1938.
[3]SMITH, C. H.: New York Acad. Med. 15:525 (Aug.) 1940.
[4]FABER, H. K.: Am. J. Dis. Child. 36:1121 (Dec.) 1928.
[5]HUENEKENS, E. J.: J. Pediat. 9:427 (Oct.) 1936.
[6]DWYER, H. L., and NEFF, J. C.: South. M. J. 33:246 (Mar.) 1940.
[7]SHARPE, J. C.: Nebraska M. J. 21:427 (Nov.) 1936.
[8]CAFARATO, T. M.: Ginecologia 4:101 (Feb.) 1938.
[9]SODEMAN, W. A.: Am. J. M. Sc. 200:117 (July) 1940.
[10]SCHOTTMULLER: Deutsche med. Wchnschr. 58-1356 (Aug. 26) 1932.
[11]VAN DER SCHEER, A.: Nederl. Tijdschr. v. geneesk. 77:163 (Jan. 14) 1933.
[12]MILLER, D. K., and BARKER, W. H.: Arch. Int. Med. 60:385 (Sept.) 1937.
[13]BARKER, W. H., and RHOADS, C. P.: Am. J. M. Sc. 194:804 (Dec.) 1937.
[14]RODRIQUEZ MOLINA, R.: Bol. Asoc. med. de Puerto Rico 32:187 (June) 1940.
[15]SUAREZ, R. M.: Am. Int. Med. 12:529 (Oct.) 1938.
[16]GOLDHAMER, S. M.: Arch. Int. Med. 53-54 (Jan.) 1934.
[17]ANNIS, J. W., and COMFORT, M. W.: Proc. Staff. Meet., Mayo Clin. 13:435 (July 13) 1938.
[18]WILSON, R.: Canad. M. A. J. 40:268 (Mar.) 1939.
[19]MEERSSEMAN, F.: Bull. et mem. Soc. med. d. hop. de Paris 55:951 (1939).
[20]FORBES, J. C.: NEALE, R. C., and SCHERER, J. H.: J. Pharmacol. & Exper. Therap. 58:402 (Dec.) 1936.

Literature on request.

LEDERLE LABORATORIES A UNIT OF AMERICAN CYANAMID COMPANY **INC.**

30 ROCKEFELLER PLAZA, NEW YORK 20 NEW YORK



DECEMBER... the star of Bethlehem and the bombs of Pearl Harbor... the Prince of Peace and the god of war ☆ Christmas will have little meaning to the thousands of physicians who serve their country and perhaps to thousands more who strive to carry on at home. There is little time for exchange of pleasantries in the grim business of winning a war ☆ But the Christmas Season will come again when the forces of evil are dead—when man again will do unto others as he would have done unto him.

Lilly

ELI LILLY AND COMPANY
INDIANAPOLIS 6, INDIANA, U. S. A.

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 December, 1943 No. 12

FEEDING THE CHILD

R. E. NUTTING, M.D.
Duluth, Minnesota

THE fundamentals in the dietary management of the child during wartime are no different than at any other time. It is possible that the problem of obtaining the essential items may become more difficult as the war continues. It is noteworthy that the children of England and Scotland, where the food shortage has been acute, are said to be in a better state of nutrition today than before the war. Numerous ingenious devices have been employed by the people of France and other occupied countries to salvage every possible protective food substance, many of which were heretofore discarded as unfit for consumption. With our natural resources it is unlikely that we will face such limitations. Our problem is to make better use of the foodstuff at our disposal, by more intelligent selection and preparation of our food, and to become informed about optimal dietary requirements.

The nutritional requirements of the infant and child are fundamental to the pediatrician. Furthermore the diet of prospective mothers must give us concern for it has recently been demonstrated that the diet of mothers during the three to four months before term definitely affects the amount of breast milk, the ability of the mother to nurse, and the general well-being of the infant.

According to Jeans, vitamin C should probably be given to the infant earlier than is our present custom. Whether an infant is receiving breast milk or some form of cow's milk dilution makes no appreciable difference with regard to the need for additional supplement. This is especially true in the artificially fed infant where the blood levels of vitamin C fall into the prescorbutic zone by the tenth day. Twenty milligrams of ascorbic acid is found to be necessary to bring this up to normal and this makes it desirable that an infant of ten days or two weeks receive an ounce of orange juice daily and by the time he is three months of age, two ounces or more.

It is recommended that vitamin D be added to the infant's feeding some time during the second or third week of life. A concentrated preparation of D_2 or D_3 miscible with the formula or a few drops of oleum percomorphum obviates the possible danger of aspiration when the larger doses of plain cod liver oil are administered. This is especially true in the debilitated infant or in the extremely fussy infants who are apt to sputter a great deal when the oil is given. Plain cod liver oil is perfectly satisfactory a little later on. One-half teaspoonful of high potency cod liver oil or one teaspoon of the less potent cod liver oil yields approximately 400 units of vitamin D which is optimal. Excessively large doses may lead to anorexia.

There is no advantage gained in giving solid food earlier than the third month. It is customary to give any one of a number of cereals of good vitamin and mineral content. Sieved vegetables, egg yolk, and sieved fruit are added to the diet during the following two or three months. Shortly after this meat soups and certain starchy foods may be added. A diet of this type which includes

From the Department of Pediatrics, The Duluth Clinic, Duluth, Minnesota. Read at the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, May 19, 1943.

one and one-half pints of either breast milk or cow's milk supplies an adequate amount of calcium, protein and the necessary vitamins and minerals.

During the transition period from the infant to the more adult type of diet the relative caloric requirement becomes less. It is during this time, around the end of the first year, and during the next few years of life, that we so often encounter appetite disturbances. This is in no small measure contributed to by the fact that there is an insistence on the part of the parents to get the child to take certain quantities of food which are out of proportion to his daily needs at this time. It is during this age period that overindulgence in sweets is permitted to the exclusion of the more essential protein, mineral and vitamin containing foods.

Due to the inadequate amount of vitamin D in the food and insufficient sunshine, the addition of vitamin D to the diet is just as important for older children as it is during the first year of life. This is a fact that is probably overlooked by many in the dietary management of the older child. While it has been shown that vitamin D-irradiated milk will prevent moderate and severe rickets, it does not completely take the place of cod liver oil.

Ever since Casimir Funck coined the term vitamin, and reported on the etiology of the deficiency diseases in 1912, there has been an ever-increasing interest in these accessory food substances. During the past few years new discoveries, especially in the realm of the vitamin B complex, have created an unwarranted concern over possible avitaminosis, both in the mind of the physician and the public. This has led in many instances to irrational therapy, self-diagnosis, and the needless expenditure of vast sums of money.

About a year ago a report prepared by the Subcommittee on Medical Nutrition, National Research Council, set down a group of symptoms and physical signs to serve as a guide for the recognition of early deficiency states in infants, children and adults. Such symptoms as lack of appetite, failure to eat an adequate breakfast, aversion to normal play, poor sleeping habits, etc., along with physical signs such as lack of subcutaneous fat, poor muscular tone, rough skin and pallor, were catalogued indicating which of these might be recognized by the laity, the nurse or the doctor.

Other groups of scientists, research workers and nutritionists have suggested methods to determine sub-clinical nutritional disturbances. Nevertheless, there is still no adequate means of recognizing minimal nutritional deficiencies.

We do have, however, at our immediate disposal optimal dietary requirements. In attacking the problem of nutrition in the child from the standpoint of these requisites we will have a relatively simple and clear-cut program to improve the health of our children through better nutrition.

The daily dietary essentials for the child may be briefly listed as follows:

Milk—one pint to one quart
Lean meat—one serving
Eggs—one or two daily
Vegetables (green or yellow)—two liberal servings
Fruit—two servings—one raw, preferably citrous
Butter or oleomargarine with added vitamin A—one square
Cod liver oil—one teaspoon—or its equivalent in a vitamin D preparation
Additional foods to make up the necessary caloric intake—whole grain or enriched bread, cereal products, sugar or fats.
Iodized salt

Too much emphasis cannot be placed on the necessity of including each one of these items in the daily menu. We must come to take the attitude in our routine prescribing of diets similar to that we ordinarily take in prescribing a diet for the diabetic. If we will do this and adhere to a schedule that includes the items as listed, we will be doing our part in combating nutritional deficiency.

Our familiarity with these optimal dietary requirements is vital if we are to assume our rightful, and I might say dutiful, leadership in the field of nutrition. All too much of the nutritional information comes from sources other than the physician. Conflicting reports and improper emphasis on this or that diet factor has led to great confusion and bewilderment in the minds of the public, i.e., in the minds of our patients. We as physicians must not only enlighten our patients through our daily contacts but also must be willing and ready to serve for and with other agencies dealing with this nutritional problem.

PREPARING THE CHILD FOR SCHOOL

JEANNETTE BAKER, M.D.
Fergus Falls, Minnesota

WE all know stories of people who have said to each other, "Let's do this together, so that if it turns out wrong, neither of us will get the blame." Maybe they say to themselves, "If it turns out wrong, I'll let on she did it." Well, I seem to be the thing those two were conniving about. For I am a product of a medical education and lay experience; so both groups can disown me and my remarks and blame them on my association with the other, if they so choose.

In my nonprofessional experience of the past ten years, I have become interested in the health of the school child from the parent's point of view as well as from the physician's, and I have become especially interested in trying to lead the parent into an understanding of the essential health measures to follow in caring for his children.

On the other hand, from my professional contacts, I have been able to appreciate the reserves which bind the physician. Always in fear of being thought mercenary he has hesitated to urge too strongly upon parents the measures which he knows to be safeguards for a child's health. Let us think now of immunization programs, especially. The physician stands ready always to cooperate in widescale immunization, but the moment he urges such a program too forcefully upon his community, a clamor of his being mercenary is apt to arise. So he leaves it to the Board of Health to offer his services in such a plan and to lay groups to educate his community to the necessity for them.

The necessity for immunizing our soldiers seems self-evident. Here is a large group of men thrown together in close contact in army camps, so, of course, they must be protected in so far as possible from the readily contracted diseases which might quickly be passed from one to another. We cannot afford to have preventable diseases incapacitate our men. Next to the mobilization of men for the army the mobilization of children for school each fall is the greatest system we know for assembling groups of persons together in close contact. Why then is it not equally important to protect *them* from the readily contacted diseases which annually incapacitate them, sometimes maiming them for life? We cannot afford to have preventable diseases incapacitate our children. Let us take seriously this job of educating our fellowmen regarding immunization and the importance of maintaining close contact with the family physician.

Where shall our course of education start? There is much to be done and there are many groups working on different phases of parent education. We who are here today can take part in this education of parents in health matters.

The average infant has fairly good supervision during his first six months. I might add that this is due mainly to his own efforts, for if his food is in any way unsatisfactory, the noises he produces galvanize the family into action. Not so with the older child who, alas, "can take it." What a lot of wrecks of people we see who "took it" to the detriment of their physical well-being.

So we start at the age of six months when the well supervised child has started his immunization program. His first birthday should find him immunized against smallpox, diphtheria and whooping cough. The smallpox vaccination should be repeated at his sixth, twelfth and eighteenth years and again whenever an epidemic is present in his community. In this way he should *never* suffer any *severe* reactions and still should obtain complete immunity against smallpox, however closely he is exposed. We are all too prone as individuals to regard smallpox as a scourge of the past; let us hope that it is. It can be—and it will be—if we as a profession emphasize to parents and the public that smallpox is controlled only by vaccination.

There are states which have compulsory vaccination, there are others which control the disease through strenuous programs of public enlightenment, there are those which are indifferent to vaccination and some retarded ones like our own which actually have laws against compulsory vaccination. Examine the statistics of these States and you will have a very clear picture of the value of vaccination,—it is just what you would expect.

Read at the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, May 19, 1943.

In New Jersey with a population of over 4,000,000 there has not been a single case of smallpox since 1931. In Minnesota, we have had in half that period about 3,500 cases. In one year alone 1924-25 we had over 4,000 cases. That started a stampede for vaccinations so that subsequent years show a marked dropping off of cases. Let us hope that we do not have to have such a severe epidemic again to remind us of the importance of immunity.

As for diphtheria, the history of its control is a dramatic one. Before 1900 almost 60 per cent of children contracting diphtheria died of it. Then antitoxin was discovered and by the turn of the century the deaths from diphtheria had been cut in half. Subsequent to the widespread use of toxin-antitoxin the incidence of diphtheria, as well as deaths from it, dropped markedly, so that today death from diphtheria is exceptional. Unfortunately, though, Minnesota has not yet immunized enough of her children less than ten years old to insure the absence of outbreaks of diphtheria. It could be eliminated from child life entirely if all children were immunized before their first birthday. The physicians of the State and the State Board of Health stand ready at any time to help their communities organize and conduct immunization programs. Let those who are leaders in their communities initiate programs for immunization of children before their first year. Then at the pre-school age the Schick test should be used to check the presence of immunity in the presence of an epidemic.

It is not important for the lay leaders to give the parents more specific directions than these except to tell them to ask their doctors from time to time about new immunization methods or about additional immunization in case of contemplated travel.

The foundation for good health is laid down in the first six years of a child's life. So from immunization let us go on to other ways of building up the pre-school child's resistance against disease. Let us call parents' attention to other ways of making and keeping the child physically fit. All of us here know the things that are good for our children. Let us train ourselves in being prompt in doing for our children the things that we know to be good for them.

Dr. Nutting has told you about feeding the child. Remember also that the child must be well rested to get the most benefit from the food he eats. He must have plenty of rest, more, very often, than he wants. He should be well rested when he comes to the table, he should eat slowly and should enjoy his mealtime hour. Moreover he should have an early bedtime hour so that he wakens rested and refreshed in the morning. When I talk to Parent-Teacher groups I stress this matter of rest as the most important point in the prevention of illness; most children do not get enough rest,—neither do most adults. We are a nervous, high-strung, often irritable lot largely because we need more rest. That is unavoidable, perhaps, in these war years for us adults, but let's give the children, at least, their chance to grow normally. And let *us* take what relaxation we can.

Another point I stress in talking to parents is the vast good that would accrue to themselves, their children and their community if they would have the fortitude to keep the "three littles" home from school. These three littles are—the little cold, the little fever and the little upset stomach. Most parents do not appreciate their importance though they do realize when they stop to think about it that most serious diseases start from one or more of them. But they are influenced by the child, who does not want to miss a day of school or who has been sold on the idea of perfect attendance as an ideal achievement. As a matter of fact that aim has been the greatest epidemic spreader known to childhood. The movies are running it a close second, so I tell the parents that when they keep a child home from school with one of the "littles" they must also keep him in bed, or at least in the house 'till he is quite well. It is surprising how many parents do not wish to be bothered when a "little" something shows up.

I would like to call your attention to the blue poster here which says "Just by keeping well, you can help win this war." With one third of the doctors in the armed forces, the rest must be left free to take care of unavoidable illness and serious accidents. The more civilians one doctor can look after, the more doctors are freed for taking care of soldiers who need their help on the battlefield. The following simple health rules are listed: (1) eat right; (2) get your rest; (3) see your doctor once a year; (4) keep clean; and (5) play some each day.

The greatest preventative measures are known to be the simplest. The U. S. Federal printing

presses are working overtime trying to bring to the people this message of prevention. The President of the United States in his Child Health Day proclamation said in part: "I call upon the people in each of our communities to renew their efforts to promote the health of children in wartime. . . ."

The Minnesota Congress of Parents and Teachers is working as never before to bring this message to the people of our communities. My job as State Chairman of Health in the Minnesota Congress of Parents and Teachers is to encourage over seven hundred P.T.A. presidents to urge upon their association the pre-school health examination for every child entering school next fall. At this examination the immunization of the child is carried forward. For the well cared for child who was immunized as suggested earlier, this will be a second vaccination, a Shick test, or another course of diphtheria toxoid. But for the neglected child, this will be his first protection against smallpox and diphtheria, a protection which is doubly important now when the child will be thrown with so many youngsters of his own age.

In the typical pre-school health examination the child receives first a general inspection to check on his body build, overweight, underweight, posture, and so on. His eyes are checked for normal vision, his hearing is tested, his throat is inspected for diseased tonsils and adenoids, his lungs and heart are examined, his feet are inspected for "flatness" and he should have the Mantoux test to discover any possible tuberculosis contact, just to mention some of the more important things. Finally, his teeth are carefully checked and the parent advised about repairs. That much comprises the health examination.

It is always difficult for me to know whether I should stress one part of the pre-school health examination more than another. It is all so important. And still we have seen so much tragedy, unhappiness, and even delinquency resulting from undetected hearing and seeing defects that I am sometimes tempted to tell parents to ask their doctors to double-check on Johnny's eyes and ears.

The second part and that which logically follows the first, is the correction of any correctable defect or the treatment of any condition which according to the doctor's recommendation would benefit the child. These examinations of the child about to enter school for the first time should be repeated every two or three years and while the State Parent-Teacher program is not urging this as consistently, for want of time, as it is the pre-school examination, it should receive the same amount of publicity. Wherever you are located we would like to have you line up with the Summer Round-Up program of the State and National Congress affiliated schools. It is an educational program pure and simple, an effort to bring to parents a realization of the importance of putting their children in the best possible physical condition and keeping them so.

We hear on every side about the great numbers who have failed to pass Selective Service examinations. Harking back to the old song—with that sentiment—"I didn't raise my boy to be a soldier"—let me say that I agree. I am not urging you to raise physically fit sons so that they will be able to fight; but think of the job of reconstruction ahead for them if they want to make this world again a fit place for their children and their children's children. Not only must they be fit to take up the burdens of reconstruction where we lay them down, but we want most of all for them to be happy and no adult who is chronically ailing can be happy. But the Selective Service examinations do show us wherein we are failing our children. Statistics show that an enormous number of our boys have defective teeth; we have no doubt been guilty of neglecting our children's first teeth as questions from parents too clearly show their ignorance concerning the importance of these.

The second defect is with the eyes. Poor vision which can so often be corrected entirely in childhood is neglected for the strangest reasons. Sometimes, of course, the parents do not realize that the child needs glasses but just as often they have been told that he does, but think correction is not important, or that spectacles would disfigure their darling, or even that the doctor "just wants to put glasses on every child he sees." Of course many of these eye conditions in childhood are not entirely remedial but parents should at least go as far as they are able in seeking correction.

A third great reason for rejections by Selective Service Boards is heart trouble. Many of these hearts could no doubt have been picked up in childhood. Many of them no doubt came from bad tonsils, rheumatic fever, and other conditions

which could have been checked or prevented altogether.

And so it goes down through the whole list of defects uncovered in adulthood. Remember that poor health disqualifies many of these adults from reaching their ultimate goal in a competitive world even though they may never have to pass Selective Service Board examinations. And the corrections of these defects are generally so simple in childhood that nothing should keep us from providing them for our children. And nothing should keep us from preaching their correction to all parents with whom we come in contact. Competition is close in the adult world; it is equally close in the world of childhood. Therefore, let us give our children every possible advantage in meeting that competition now and in their future. Let us see that all children are prepared for school life before we throw them into it. Let us be prompt in doing for our children those things which we know to be best for them.

Let us—both lay and professional groups—band together to bring to the parents of our school children this message: lay a sturdy foundation for our postwar men and women who are now running about our homes as children; give them plenty of rest, opportunity for wholesome fun and good nourishing food. Thus can we do our share for the present generation of children and exert our influence on the postwar world.

EMOTIONAL DISTURBANCES OF CHILDREN IN WARTIME

HENRY F. HELMHOLZ, M.D.

Rochester, Minnesota

THERE is no difference between the character of emotional disturbances in wartime and in peacetime. The children who would have emotional disturbances in peacetime probably will have them in wartime and, in addition, a certain number of children who would just have managed to avoid them in peacetime, will succumb to them because of the greater variety and intensity of the causes in wartime. As seen in wartime England, the emotional disturbances of children who were separated from their parents in London and sent to foster homes in the country were more severe and more frequent than the disturbances caused by the bombing of the children who stayed in London with their parents. The inability to make a satisfactory adjustment by the evacuated children manifested itself by numerous emotional disturbances. These include: (1) bodily symptoms, such as bedwetting, loss of bowel control, vomiting, sleepwalking and various habit spasms; (2) neurotic reactions, such as various anxiety states and hysterical manifestations; and (3) various social behavior disturbances, such as lying, stealing, abrupt changes of behavior, destructiveness, aggressiveness and submissiveness.

What new factors has the war introduced into the homes that have given young children a feeling of insecurity and have led to an increased number of emotional disturbances? The home is a haven for the child, a place in which he knows every nook and corner, a place in which there is a father and a mother to protect him. In the home there should be some permanence and stability and a continuity in the family circle. It is here that the child obtains the gratification of his desires and it is here that he must learn to make the necessary renunciation of his efforts of gratification that will make him an acceptable member of the family group. The disrupting influences that the war has caused can be summarized in one sentence. It has destroyed, at least temporarily in many homes, one or more of those factors that have made home a haven of safety for the child. "If children ever needed mothering and fathering, they need it now," as Miss Lenroot, head of the Children's Bureau of the United States Department of Labor, has said. Fathers have been taken out of homes into the armed services or into defense jobs at a distance. The feeling of protection that is given by the coming and going of the father each day cannot be replaced by any other person. It is bad enough if the father does not realize the im-

From the Section on Pediatrics, the Mayo Clinic, Rochester, Minnesota. Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, May 19, 1943.

portance of his spending some time with his children, but if he is gone it is more difficult still to fill this void. In many cases, the mother also has entered war service. This has left older children without adequate supervision or with an empty home that they can re-enter with the key that was tied around their neck when they went to school. The mothers return many hours later. The infant and preschool child are placed in a day nursery or nursery school, which often is inadequate because of the lack of personnel and proper quarters. In such home conditions the factors of fatigue and improper diet are bound to place a further strain on the child. Furthermore, in this unnatural environment the child has no opportunity to develop a regular routine and he loses his recreational opportunities. The effect of loss of personnel is here again very evident, as seen in the development of an excellent Boy Scout Troup into a gang of delinquents through loss of its leader. The great migration of the population to the 400 defense centers has resulted in overcrowding to a degree that families who formerly lived in ample homes have to live in single rooms and three people who work different eight-hour shifts often sleep in one bed. It is fortunate that in Minnesota there has not been any great shift of population; therefore, this factor is not as important here as in many defense areas.

How can these defects in the home environment be remedied? In the homes that are still intact, the parents must be made to realize that their children mirror their anxieties and worries, in spite of what may be said to the contrary, namely, "Your children can take it, if you can." Parents must face the facts resolutely. They must be honest with their children in regard to danger and must let them see that a certain degree of anxiety is not an unnatural thing. To keep them busy in the usual channels is building actual morale. Activities that can be engaged in by the family as a whole, contacts such as holding children by the hand, holding the small child closely give it a sense of personal security.

A male relative or friend who can keep contact with the children will help to keep intact the feeling of a protecting father. The mother is harder to replace; therefore, as completely as possible, mothers with young children should be kept out of industry. Their defense work is in the home. When mothers with young children must work, care of children in day nurseries and nursery schools must be arranged. Foster home care or help in the home may in some instances better meet the problem. In the defense areas, better housing and recreational opportunities must be developed as rapidly as possible. The increase of delinquency is in a measure due to the failure of recreational facilities arising from the drafting of trained personnel and this must be remedied as soon as possible by the training of volunteer workers.

For the child of school age the difficulties are equally great. He has not only the difficulties in the home which have been enumerated, but he is subjected to the disrupting influence of the loss of many teachers to the services and replacement by those with less training and natural inclination to teach. More serious still is the closing of many schools because of complete lack of teaching personnel. In the defense areas, even worse is the very lack of school buildings. Here, as in the home, the teacher by her attitude and reassurance accomplishes more by her equanimity, composure and confidence than by anything that she may say. The children feel secure as long as they feel that they "belong" and when they are accepted as equals by their classmates. (The difficulties of various racial groups in the city schools as well as friendly and enemy aliens constitute a difficult problem for even a skilled teacher to handle.) It is the duty of the teacher to see that groups do not become isolated but are brought back into the general group and that an atmosphere of tolerance is developed. By various activities, such as scrap collections and selling defense stamps, the group solidarity can be fostered. The adopting of a military unit by the class increases the feeling of having a part in the war effort. The teacher has the same position in the school that the parent has in the home, but she cannot be expected to overcome that which has been neglected in the emotional education of the child in the home. She merely can develop that which was brought by the child when entering school.

I can best summarize by quoting from the Children's Charter in Wartime as written by the Children's Bureau Commission on Children in Wartime:

> Both as a wartime responsibility and as stepping-stones to our future—and to theirs—we call upon all citizens, young and old, to join together to—

I. Guard children from injury in danger zones.

II. Protect children from neglect, exploitation, and undue strain in defense areas.

III. Strengthen the home life of children whose parents are mobilized for war or war production.

IV. Conserve, equip, and free children of every race and creed to take their part in democracy.

Childhood anxiety can be as devastating as disease.

The home and the school still remain the fountains of security for the child and whatever can be done to compensate for the wartime disorganization of these structures by home-protective, mutual-affection efforts in the family and mutual aid interests in the school will pay remarkable dividends in the health of the children of this country.

CARCINOMA OF THE LUNG

HERMAN J. MOERSCH, M.D.

and

WILLIAM S. TINNEY, M.D.

Rochester, Minnesota

THE past decade has witnessed marked progress in the field of thoracic surgery and the ability of the thoracic surgeon to deal successfully, in properly selected cases, with carcinoma of the lung. Unfortunately, during this same period there has not been a comparable advance in the prompt and early diagnosis of the disease. The great majority of patients who have carcinoma of the lung still reach an inoperable state before the correct diagnosis is definitely established. If progress is to be made in the successful treatment of this disease, it is imperative that attention be directed to the symptomatology, physical findings, and those diagnostic procedures which will be of aid in its early recognition. With this thought in mind the following study is presented.

From 1925 to 1942, inclusive, the clinical diagnosis of bronchiogenic carcinoma has been made in 948 cases at the Mayo Clinic. In 448 cases the diagnosis was confirmed by microscopic examination of tissue obtained from the primary lesion by bronchoscopy, surgical exploration or postmortem examination. In seventy-three additional cases, the diagnosis was established by biopsy of metastatic lymph nodes or examination of fluid aspirated from the thorax. We shall limit our study to the group of 448 cases.

Bronchiogenic carcinoma is no respecter of age or sex. In our group it was found to occur nearly five times as frequently in the male as in the female sex (Table I). Until thirty years of age it occurs with practically the same frequency in the two sexes. From then on, it occurs with increasing frequency among men as compared with women with each decade, until at the seventh decade it is almost nine times as frequent among men as among women. Like carcinoma elsewhere in the body, bronchiogenic carcinoma occurs more frequently after than before forty years of age. Eighty-eight per cent of the patients in our group were more than forty years of age. The highest incidence of the disease was in the sixth decade.

TABLE I. AGE AND SEX INCIDENCE OF BRONCHIOGENIC CARCINOMA

Age, years	Cases	Male	Female
10–19	2	1	1
20–29	13	7	6
30–39	38	28	10
40–49	108	81	27
50–59	180	157	23
60–69	98	88	10
70–79	8	7	1
80–89	1	1	0
Total	448	370	78

Symptoms

A review of the symptomatology of bronchiogenic carcinoma is of extreme importance if progress is to be made in treatment of the disease.

From the Division of Medicine of the Mayo Clinic and the Mayo Foundation, Rochester, Minnesota.

TABLE II. FREQUENCY OF SYMPTOMS OF BRONCHIOGENIC CARCINOMA

Symptom	Cases	Per Cent	First Symptom, Per Cent
Cough	365	81	37
Loss of weight	316	71	4
Dyspnea	301	67	8
Pain	244	54	21
Hemorrhage	239	53	12
Chills and fever	197	44	?
Wheeze	54	12	3
Clubbing of fingers	40	9	0.9
Hoarseness	34	8	2
No thoracic symptoms	23	5	—

Only by calling attention to its earliest and most common symptoms can this be accomplished. One of the greatest obstacles to the early diagnosis of carcinoma of the lung is the fact that it does not give rise to a characteristic train of symptoms. The symptoms are those associated with pulmonary inflammatory disease in general. Because of this, all too frequently the patient is allowed to go an undue length of time before a thorough examination is undertaken, and by then the carcinoma often has reached a hopeless state.

The symptoms caused by bronchiogenic carcinoma depend largely on the situation of the tumor and the degree of bronchial obstruction it produces. In Table II are listed the most common symptoms encountered among the 448 patients in this group, and the frequency with which each was the first symptom to appear. Cough was by far the earliest and most frequent symptom mentioned, and at the onset was usually dry and nonproductive. A large percentage of the normal population suffer from a so-called "cigarette cough" and fairly frequently the first warning of serious disease is so misinterpreted. It is therefore imperative in any case in which an unexplained, persistent cough develops, especially if the patient is more than forty years of age, that the possibility of carcinoma of the lung be entertained seriously.

As the tumor increases in size and fills the lumen of the bronchus, it interferes with normal drainage of the bronchi distal to the lesion. The retained secretion furnishes an excellent cultural medium for invading organisms and, depending on the character of such organisms, bronchitis, bronchiectasis or abscess may develop. The cough may now become productive and the sputum purulent.

With further increase in size of the tumor, edema of the bronchial mucosa or plugging of a reduced bronchial lumen by thick, tenacious secretion, there may be a damming back of secretions. This gives rise to chills and fever. Usually, after an interval of three to five days, the bronchial obstruction is relieved by evacuation of the retained secretion, with relief of the chills and fever. Very frequently, such an episode is mistaken for an attack of pneumonia and the patient is treated on this assumption. It is of significance that in approximately half the cases, a diagnosis of pneumonia had been made at some time or other during the course of the patient's illness. This illustrates the importance of a careful antecedent history in every case of suspected pneumonia.

Approximately half of the patients gave a history of expectoration of blood. This may vary from streaking of the sputum with blood to very copious or even fatal bleeding. Because the bleeding is usually associated with cough, the underlying condition can easily be mistaken for pulmonary tuberculosis, and at times the differential diagnosis may be extremely difficult. Thirteen of the patients in our series spent several months in tuberculosis sanatoriums before the correct diagnosis was established.

As the pulmonary carcinoma increases in size, it decreases the caliber of the bronchial lumen either by intrabronchial enlargement or by extrabronchial compression, interfering with the air entering and leaving the lung distal to the point of obstruction so that atelectasis soon develops. As a consequence of this development, dyspnea is likely to occur. Dyspnea may also be produced by compression of the lung from accumulation of fluid in the pleural space, which is invariably due to extension of the carcinoma to the pleura. Pleural fluid was present in 15 per cent of our cases. Dyspnea associated with carcinoma of the lung often seems out of proportion to the size of the lesion and the degree of associated atelectasis. It usually is gradual in its development, but occasionally occurs with great sudden-

ness. When the dyspnea is sudden in appearance, and especially when it is associated with wheeze, it may occasionally be incorrectly regarded as being due to asthma.

Pain was noted as a presenting symptom in more than half of our cases. This varied from a sense of discomfort or pressure to a severe, sharp pain requiring morphine for relief. The appearance of sharp pain in bronchiogenic carcinoma is of especial significance, for it usually indicates that the carcinoma has spread to the pleura, thoracic cage, mediastinum and neighboring nerves, and usually means that the condition is inoperable. Occasionally, pain is the first symptom manifest. This is especially true if the carcinoma arises in the apex of the lung, the so-called superior sulcus carcinoma. The pain in this condition is caused by impingement of the growth on the brachial nerves, and usually first appears about the tip of the shoulder and about the shoulder girdle. In its early stage it is invariably regarded as being due to neuritis and is incorrectly treated as such.

Hoarseness is a relatively infrequent and late manifestation of bronchiogenic carcinoma. When present, it is of considerable prognostic significance, as it means that the carcinoma has spread to the mediastinum and has involved the recurrent laryngeal nerve.

Although loss of weight occurs frequently, it does not have any direct relation to the operability of the carcinoma. The same is true with respect to clubbing of the fingers. Although clubbing was usually observed in the cases in which there was pulmonary suppuration associated with the pulmonary carcinoma, this was not invariably true. In four cases, clubbing of the fingers was the first manifestation of difficulty.

A most interesting group of cases is the 5 per cent in which there were no symptoms referable to the thorax and in which the condition was detected during the course of a routine physical examination, or in which the patient had been referred for a special examination of the chest because of unusual neurologic findings. In nineteen cases, or 4 per cent, the only symptoms were those referable to the central nervous system. This group reveals how early bronchiogenic carcinoma metastasizes to the central nervous system, a fact that has led our Section on Neurology to obtain a routine roentgenogram of the thorax in the case of every patient suspected of having an intracranial or intraspinal lesion. In fifty-three cases, or 12 per cent, symptoms referable to the central nervous system were observed.

The average duration of symptoms from onset until the diagnosis was made was eight and a half months. There are three important reasons for this deplorable delay in diagnosis: (1) the lack of specificity of the symptoms; (2) failure to suspect the presence of a carcinoma of the bronchus; (3) difficulty in establishing a positive diagnosis even when the condition is suspected.

Physical Examination

The physical findings in primary carcinoma of the bronchus are dependent on the situation of the tumor, its size, the degree of bronchial obstruction produced, the secondary inflammatory changes present and the degree of pleural involvement. A small tumor in the periphery of the lung may escape detection even with the most careful examination, and may be found only on roentgenologic examination.

A most valuable, but frequently neglected, aid in diagnosis is inspection of the thorax with the patient in the recumbent position. This often will give more information than any other procedure. It will be noted that expansion of the chest on the involved side lags behind that on the unaffected side. Special attention should be directed to the presence of a wheeze. This can be elicited most easily by having the patient breathe with the mouth open in the recumbent, upright and bending forward positions, the examining ear being held close to the patient's mouth. If the region of atelectasis or the tumor itself is in close proximity to the chest wall, one may elicit dullness on percussion over the involved region. The presence of pleural fluid or pulmonary suppuration can easily obscure all findings. On auscultation, the most important findings is suppression of breath sounds over the region of involvement, which may indicate bronchostenosis. In cases in which secondary infection has developed and bronchial obstruction is not complete, there may be scattered coarse râles associated with the suppression of breath sounds.

A careful search should be made in every case for metastatic lymph nodes. Table III demonstrates the frequency with which metastatic lymph nodes were discovered on routine physical ex-

amination. They were observed in 15.4 per cent of the cases. Although this is obviously a late sign, there is probably no other clinical finding that so expedites the diagnosis and settles the problem of prognosis and treatment as the discovery of a firm, well fixed supraclavicular, cervical or axillary node. This is such an important and frequent clinical manifestation that a careful search, particularly for supraclavicular nodes, should be made in every physical examination.

TABLE III. PRESENCE OF METASTATIC LYMPH NODES

Site	Cases
Supraclavicular	42
Cervical	13
Axillary	4
Submaxillary	1
Multiple	7
Chest wall	2
Total	69

Roentgenographic Examination

Roentgenographic examination of the thorax is second in importance only to a thorough history and physical examination in the early diagnosis of bronchiogenic carcinoma. We believe that this should be a routine procedure in the case of every patient who has a chronic cough, pain in the thorax, expectoration of blood, unexplained fever or loss of weight and in the case of any patient who is having a general physical examination. This latter belief is substantiated by the fact that in this series there were twenty-three patients who had not had any pulmonary symptoms. The diagnosis in these twenty-three instances was not suspected until the lesion was discovered by routine roentgenographic examination of the thorax. In 73 per cent of our cases, the roentgenologist correctly suspected the presence of a bronchiogenic carcinoma from the roentgenogram alone. In most of the other cases a pulmonary lesion was manifested by roentgenographic examination but carcinoma of the bronchus was not suspected. This lesion was most frequently confused with lymphoblastoma, bronchiectasis, pulmonary abscess, benign tumors, pleural effusion, tuberculosis and aortic aneurysm.

It is also important to remember that a negative roentgenogram does not definitely rule out the presence of carcinoma. If the history or physical findings even vaguely suggest the presence of carcinoma of the bronchus, one should not be deterred by a negative roentgenogram from performing further and more extensive diagnostic procedures.

Bronchoscopy

The early diagnosis of carcinoma of the bronchus can be confirmed most easily and accurately by bronchoscopy. If this procedure is employed whenever there is any suspicion of such a lesion, the early diagnosis will be facilitated and in many more cases the carcinoma will be discovered before it reaches an inoperable state. Bronchoscopy is also of value in determining the character and the exact situation of the tumor, particularly its relation to the carina, and is therefore helpful in deciding on the operability of the lesion. Care must be exercised, however, in determining whether a tumor that projects into the lower part of the trachea actually involves the carina, the main bronchial opening or the trachea, or is simply a projection of a tumor which originates lower down in the bronchus.

Bronchoscopy may also be of value in aspirating retained secretion, a measure which often is of aid in improving the patient's general condition, thereby decreasing the surgical risk should pneumonectomy be contemplated. It may be necessary to repeat bronchoscopy a number of times before a satisfactory piece of tissue can be obtained for microscopic examination. A negative result of bronchoscopic examination does not rule out the possibility of a bronchiogenic carcinoma.

Bronchoscopic examination was performed in 399 of our cases, and a positive biopsy was obtained in 368 cases, or 92 per cent. This, however, does not truly represent the accuracy of this diagnostic procedure, since many cases were not included in the series because of failure to obtain suitable biopsies. In the total group of 948 cases studied, bronchoscopy was performed in 636 cases, and 399 cases, or 63 per cent, positive tissue was obtained. This latter figure likewise is not absolutely accurate as to the efficiency of bronchoscopy as a diagnostic aid because in

nineteen of the cases, although a definite tumor could be visualized through the bronchoscope, it was not possible to obtain a satisfactory specimen for biopsy; the diagnosis of bronchial carcinoma was confirmed later at the time of operation or at necropsy. There is also a possibility that in not all of the 636 cases in which bronchoscopy was performed was the condition actually primary carcinoma of the lung, even though it was regarded as such clinically.

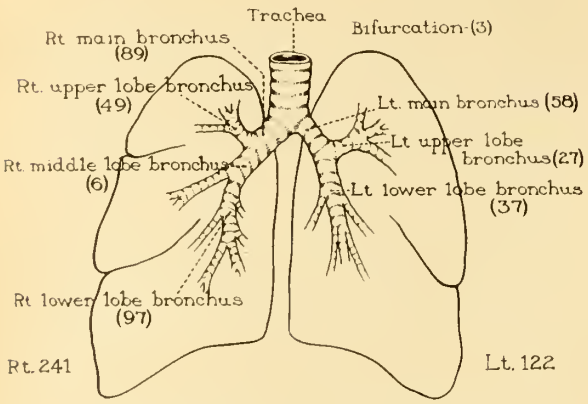


Fig. 1. Site of tumor in 368 cases (location of two unknown).

Situation of Tumor

A study of the situation of the carcinoma in our group of cases was of interest. The right lung was found to be involved approximately twice as frequently as the left lung. In 368 of the 448 cases, the data were sufficiently accurate to designate a definite lobe in which the tumor was situated. This distribution according to lobe is illustrated in Figure 1.

Pathology

The tumors were typed and were graded according to Broders' classification (Table IV), in which grade 4 is the highest degree of malignancy and grade 1 the lowest. Squamous cell carcinomas were slightly more frequent than adenocarcinomas, being 52 per cent of the tumors that were typed, as against 45 per cent for adenocarcinomas. Of the adenocarcinomas, 149 affected men and thirty-two, women. For squamous cell carcinoma the corresponding figures were 187 and twenty-four. The importance of early diagnosis and prompt surgical intervention is readily apparent when one realizes that 50 per cent of pulmonary carcinomas that were graded were of grade 4 malignancy. Thirty-three per cent of the carcinomas that were graded were of grade 3 malignancy. Thus, a total of 83 per cent of the tumors were of a high degree of malignancy.

TABLE IV. TYPE AND GRADE OF BRONCHIOGENIC CARCINOMAS

Type and Grade	No. Cases
I. Adenocarcinoma	181
Grade	
1	32
2	24
3	52
4	71
Not graded	2
II. Squamous cell carcinoma	211
Grade	
1	0
2	10
3	78
4	122
Not graded	1
III. Mixed adenocarcinoma and squamous cell carcinoma	13
IV. Not Specified	43

We have included thirty-two cases of adenocarcinoma grade 1, the so-called adenoma, because we regard these tumors as potentially, if not actually, malignant. In one case of adenocarcinoma grade 1, or so-called adenoma, invasion of the wall of the bronchus and of the mediastinal lymph nodes was observed at necropsy. Grade 1 adenocarcinomas, or so-called adenomas, differ from other types of bronchiogenic carcinoma in that they occur in younger persons, have a different appearance on bronchoscopic examination from other bronchiogenic carcinomas, are much slower in development and seldom metastasize. If they are permitted to remain in the bronchus, they will lead to pulmonary suppuration and eventually to the death of the patient.

Necropsy was performed in seventy cases. The incidence and location of metastasis are listed in Table V. A diagnosis of Addison's disease had

been made clinically in one of the cases, in which there were metastatic lesions in the adrenal glands, which were found to be almost completely destroyed. There was pleural effusion in 27 per cent of the seventy cases, and in 16 per cent of them the effusion was hemorrhagic. Pulmonary abscess, bronchiectasis or empyema was present in 44 per cent of the seventy cases.

TABLE V. METASTASIS FOUND AT NECROPSY

Situation	Cases	Per Cent
Lymph nodes (regional)	55	79
Lungs and pleura	34	49
Adrenals	25	36
Liver	24	34
Bones	16	23
Vertebræ	10	14
Ribs	8	11
Sternum	1	1
Pelvis	2	3
Femur	1	1
Brain	13	19
Pericardium and heart	13	19
Kidney	15	21
Brachial plexus	2	3
Spinal cord	1	1

Prognosis

A follow-up study was made in 315 cases, or 70 per cent. The average duration of life after diagnosis was made was six months. The prognosis was the same in both adenocarcinoma and squamous cell carcinoma, regardless of the grade of the tumor. The average duration of illness from the first symptom until death was fourteen and a half months. Since it required an average of eight and a half months after onset of symptoms to make the diagnosis, the patients had obviously lived more than half their expectancy before there was any opportunity to consider surgical exploration. This is undoubtedly the most important cause of the poor prognosis of bronchiogenic carcinoma, since the type and grade of the tumor were not factors in this series of cases.

Conclusions

It is obvious that if progress is to be made in the successful treatment of bronchiogenic carcinoma, earlier diagnosis or improvement in present methods of medical and surgical treatment must take place. Inasmuch as no new successful method of treatment has presented itself on the medical horizon, and it is known that pneumonectomy, if performed early, offers the best chance of cure, it is self-evident that early diagnosis becomes the most pressing problem, The medical profession is face to face with the fact that bronchiogenic carcinoma does not always present a characteristic picture, but a picture seen frequently in other types of pulmonary disease. It would therefore seem advisable to suspect the possibility of an underlying bronchiogenic carcinoma in any case, especially if the patient is more than forty years of age, in which pulmonary symptoms of unexplained causation develop. Thorough physical examination alone is not sufficient; a roentgenogram of the thorax should also be made. It is only by adhering to this rule that one can hope for progress at the present time in dealing with this important problem.

Until recently, primary carcinoma of the lung was regarded as a relatively rare type of cancer. We are now recognizing that it is one of the commonest forms of neoplasm. It has been discovered that around 10 per cent of all cancers originate in the lung, that this organ is surpassed only by the stomach as the most frequent site of beginning malignancy, and that approximately 15,000 Americans succumb annually to carcinomata that arise from lung structures, usually in the bronchi. Such stark statistics and the demonstrated fact that cancer of the lung, like pulmonary tuberculosis, can be found early by employment of readily available diagnostic facilities, provide all physicians with food for thought as they evaluate the chest complaints presented by patients, especially men, and particularly those past forty years of age.—*Tuberculosis Abstracts*, December, 1943.

USE OF CURARE IN METRAZOL TREATMENT OF PSYCHOSES

Report of Manic-Depressive Case Complicated by a Compression Fracture of the Spine

E. W. MILLER, M.D.
Saint Peter, Minnesota

OUR experience at the Saint Peter State Hospital has confirmed the findings of Bennett,[1] Cottington,[3] and others that metrazol produces a high percentage of remissions, in a relatively short length of time, in those psychoses characterized by depression. Even some with a senile or arteriosclerotic psychosis with depression as the outstanding feature have shown a complete disappearance of this symptom.*

The depressions seen in this State Hospital are primarily manic-depressive and involutional melancholia. Our results with the first one hundred patients in these two categories, treated with metrazol, have been good—seventy-two appearing entirely normal at the termination of treatment (save for recent memory defects which will be referred to later). In addition eleven others showed varying degrees of improvement short of complete. Fourteen showed no improvement at all. In three the treatment was not completed because of complications.†

Symptom duration appears of some significance as eight of the fourteen patients showing no improvement had a duration of symptoms in excess of two years, and in three others it was greater than one year.

Metrazol is not, with the possible exception of involutional melancholia, to be considered a cure in the ordinary sense of the word. With the aforementioned exception, depressions are prone to recur, given the right situation, and it is perhaps better to use "remission," "improvement" or some comparable term rather than "cure."

Involutional melancholia and manic-depressive psychoses (depressive phase) ordinarily carry a favorable prognosis and the majority will recover from the given attack, in time, with any type of treatment, or with none. However, we believe that metrazol, and judging from the favorable reports in the literature, electrical shock, markedly shorten the period of illness and thus are a distinct benefit to the patient and his or her family.

Soon after metrazol became rather extensively used it was discovered that the convulsion associated with this therapy was producing many compression fractures of the spine.[6,7]

After first trying various mechanical devices and drugs in attacking this problem, Bennett[2] found that curare, a poison used by South American Indians which inhibits passage of a nerve impulse across the myoneuro junction, effectively "softened" the metrazol convulsion without impairing its therapeutic effectiveness.

The following case is reported because we were able to continue giving metrazol therapy, in spite of a compression fracture of the spine by the use of curare.*

Mrs. X, aged fifty, was admitted to the hospital, July 9, 1942, after having attempted suicide by drowning two days previously. The patient was a Normal School graduate who taught until her marriage at twenty-six. Her husband, a farmer, aged sixty-two, and a son, aged nineteen, were both living and well. There had been one miscarriage.

Upon admission the patient was agitated and depressed. She paced the floor continuously, wringing her hands, and bemoaning that everyone now knew that she was "no good," that there was nothing to live for, that she was disgraced, and could never again face her relatives and friends. A more formal history revealed that at the age of eighteen she had sexual relations with an uncle who lived under the same roof. Shortly afterward she became depressed, was not hospitalized, and spontaneously improved in about four months. This uncle died about one year prior to the patient's admission. She believed that he had left her in his will a sum of money because of prior relations with him and that everyone now knew the true reason for this; in fact, full accounts of the matter were being published in the local newspaper. In consequence she felt disgraced, withdrew from associating with her friends because they were making derogatory remarks concerning her, found that she could no longer per-

*Our oldest patient in this category was sixty-nine years old, had generalized arteriosclerosis and a moderate hypertension. His treatment (seven convulsions) was uneventful. He has been home since September, 1942, and is reported as doing well.

†Therapy was discontinued for the following reasons:
1. Developed an aspiration pneumonia and died.
2. Pulmonary tuberculosis reactivated.
3. Compression fracture of the spine (prior to our use of curare).

*Intocostrin Squibb was the solution of curare used. This is packaged in 5 c.c. rubber capped vials containing 20 mg. per c.c. of the active curare principle. The product has not been released under the provisions of the Federal Food and Drug Act and is as yet obtainable only under certain prescribed conditions.

form her usual household tasks, developed anorexia and insomnia, finally jumped in the cistern with suicidal intent.

Her menses had been normal until about three or four months previously. At that time, they stopped which disclosed a compression fracture of the fifth thoracic vertebræ. The therapy was discontinued. Her mental condition appeared moderately improved. A few days later she began to relapse and developed a new worry. She feared that one hundred pounds of



Fig. 1. Radiograph taken August 4, 1942, showing a compression fracture of the fifth thoracic vertebra. This was undoubtedly caused by the use of metrazol.



Fig. 2. Radiograph taken October 27, 1942, showing no aggravation of the fracture, although in the intervening period fourteen curare-metrazol convulsions were given.

abruptly to return two weeks before admission. This was a heavier and more prolonged flow than usual. For two months she had noticed hot flashes.

Her brother and her father's sister had had one and several attacks of depression respectively. Had there been no previous depression she would have been regarded as a rather typical case of involutional melancholia. However, in view of her history, the diagnosis was made of manic depressive—depressive psychosis.

From July 12 to 15, it was necessary to place her in restraint because she thought other patients were making sarcastic references to her illicit sex experience and persisted in striking and throwing chairs at them.

She continued depressed, agitated, and actively suicidal until July 17 (eighth hospital day) at which time metrazol was started. No x-ray of the spine is taken at this hospital prior to the inauguration of therapy unless a specific indication is present. In her case there was no history of injury to her back, although she had frequent attacks of "lumbago." In jumping into the cistern she stood within three feet of the water level and stepped "easily" into seven feet of water without hitting bottom or striking her back against the opening into the cistern. After five treatments (all producing convulsions) the patient complained of pain "between my shoulder blades," a symptom not previously present. An x-ray was obtained on August 4 (Fig. 1)

sugar purchased before rationing, and properly declared when sugar rationing coupons were obtained, was in some way illegal and would lead to her husband's arrest. Although her husband realized she was not in good mental condition he requested, and was permitted, to take her home. Two days later she was returned because of a definite increase in her agitation and threats of suicide.

In the administration of curare 15 to 20 mg. to 20 pounds of body weight are given intravenously in one to one and a half minutes. (As a precaution 1 c.c. less than the estimated dose is given the first time.) If the desired effect is obtained (tested by inability of the patient to raise the head off the bed two minutes after completion of injection) metrazol is given in the usual way,[4] twice a week. The result is a "convulsion" attended by minimal muscular contractions.

On August 20, no improvement being as yet apparent therapy with curare and metrazol was started. After twelve such treatments the patient seemed entirely over her depression and following fourteen treatments the therapy was discontinued (October 16). Throughout she exhibited about the same degree of apprehension with curare-metrazol as with metrazol alone, i.e., feared that she would not wake up, complained about the terrifying sensation experienced when "going under," et cetera.

All local symptoms of pain, et cetera, referable to her back had disappeared by the time curare-metrazol was

started although no treatment,* not even bed rest, was given. No cord symptoms were present at any time.

Throughout two weeks following completion of therapy she exhibited complete insight. She realized that she had undergone another depression, explained that her former statement regarding sexual relations with her uncle was true but there had been no reason to believe that this had been publicized and that her so believing must have been "imagination." She had not received any legacy from him. She remembered vaguely worrying about something concerning sugar, could not recall the details, but realized that there could have been no adequate reason for her fear. Her mood was cheerful, she associated normally with her companions, showed an active interest in her environment, and manifested a hopeful attitude toward the future. Her only concern was over a noticeable forgetfulness. Names of new patients she met could not be remembered the next day, items read in the paper were soon forgotten, and so on. She readily accepted the explanation that this often occurred with metrazol[8] and would eventually disappear.

An x-ray October 27 (Fig. 2) showed no significant change in the appearance of her fractured vertebræ.

On November 8, 1942, she was paroled to her husband.

In March, 1943, the patient and her husband were interviewed. She stated that she had felt her usual self since returning home; had done all her housework; had resumed her usual social activities, was cheerful and optimistic.

The forgetfulness about which she had complained prior to her parole had gradually disappeared and both the patient and her husband believed her memory to now be as good as ever. Her menses had returned three weeks before parole and had continued with a normal twenty-eight day cycle. There was nothing unusual about the character or duration of flow. She had not noted "hot flashes" since leaving the hospital.

She inquired as to whether curare and/or metrazol was a cure for "lumbago." She explained that for as long as she could remember she had had an average of at least one attack a month, that these were severe enough to often cause her to remain in bed for about one week, and that in the approximately four months since her parole she had had none; in fact, "As long as I can remember I have never gone so long a time with no pain in my back."

Her husband stated that he believed his wife to be her usual self, albeit somewhat "down in the dumps" for an hour or two not oftener than once a week. He explained that it was customary for her to exhibit this trait and that she had done so for as long as he had known her.

*It has been known that compression fractures often occur with epilcptic convulsions, cause only minor symptoms or none at all, and commonly require no treatment.5 Nevertheless, deliberately inducing convulsions, in the presence of a recent compression fracture, would seem contraindicated.

Summary

A case of depression is reported which, when treated with metrazol, developed a compression fracture of the spine. Metrazol was continued by combining its use with curare. There was no aggravation of the fracture. A good therapeutic result was obtained. Coincidentally, frequent attacks of "lumbago" have, at least to date, been favorably modified.

References

1. Bennett, A. E.: Convulsive shock therapy in depressive psychosis. Am. J. M. Sc., 196-420, (Sept.) 1938.
2. Bennett, A. E.: Preventing traumatic complications in shock therapy by curare. J.A.M.A., 114:322-324, (Jan.) 1940.
3. Cuttington, R., and Gavingan, A. J.: Metrazol treatment of depression. New England J. Med., 220:990, (June) 1939.
4. Freeman, G. H., Nissen, A. S., and Miller, E. W.: Pharmacological shock therapy at St. Peter, Minnesota. Medicine, 25:31, (Jan.) 1942.
5. Moore, M. T., Winkelman, N. W., and Salis-Cohen, L.: Asymptomatic vertebral fracture in epilepsy. J. Nerv. & Ment. Dis., 94:309, (Sept.) 1941.
6. Polatin, P., Friedman, M., Harris, M., and Horwitz, W.: Vertebral fracture produced by metrazol induced convulsions. J.A.M.A., 112:1684, (April 29) 1939.
7. Wespi, H.: Ein Fall von spontaner Wirbelfrektur im Cardiozoiafall. Schweiz. Arch. f. Neurol. u. Psychiat., 42:404, 1938.
8. Ziskind, Eugene: Memory defects during metrazol therapy. Arch. Neurol. and Psychiat., 45:233-234, (Feb.) 1941.

THE DISCOVERY OF THE PULMONARY CIRCULATION OF THE BLOOD

MAX NEUBURGER
Vienna, Austria

WILLIAM HARVEY'S essay "Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus" is a complete and systematic discussion of the circulation of the blood. One who reads this essay with thoroughness and peruses without bias what his "precursers" wrote on the circulation of the blood must be convinced that credit for its discovery should be given solely to the great Briton. It is his *comprehension of the idea of the circulation in its entirety* and his ability to produce *complete proof* of his discovery

On the occasion of Max Neuburger's seventy-fifth birthday anniversary (December 8), the translation of this very important but generally overlooked article is presented. Translated by Alfred Rosenthal, Saint Paul, Minnesota, from Sudhoff's Archiv für Geschichte der Medizin, 23:7-9, 1930.

that makes his scientific work appear so valuable in comparison with all previous efforts.

Even those who still, out of national preference, award the laurels to Caesalpinus, cannot deny Harvey's superiority in the presentation and proof of his facts. Except among a very small number of authors, the common opinion prevails that nobody discovered and described the circulation of the blood *in toto* earlier than Harvey, and that any credit which might be given to his predecessors, especially Servetus and Realdus Columbus, must be for having found only a part truth on the ground of anatomical observations and experimental research.

Servetus and Realdus Columbus rejected the Galenic hypothesis, according to which blood passes from the right ventricle through the septum into the left ventricle. They recognized that the way the blood travels must be a different as well as a longer path, extending from the pulmonary artery through the parenchyma of the lungs into the pulmonary veins. Servetus says in his script *Christianismi Restitutio:* "Fit autem communicatio haec non per parietem cordis medium, ut vulgo creditur, sed magno artificio a dextro cordis ventriculo, longo per pulmones ductu, agitatur sanguis subtilis. A pulmonibus praeparatur, flavus efficitur et a vena arteriosa in arteriam venosam transfunditur." In the main, Realdus Columbus made a like statement, and in addition proved the presence of blood in the pulmonary veins: nam sanguis per arteriosam venam ad pulmonem fertur ibique attenuatur. Deinde cum aëre una per arteriam venalem ad sinistrum cordis ventriculum defertur, quod nemo hactenus aut animadvertit aut scriptum reliquit" (De Re Anatomica VII).

From these quotations, especially in recent times, the conclusion frequently was drawn that Servetus and, independently, Realdus Columbus discovered and described the *pulmonary circulation* and that Harvey merely confirmed what others had discovered earlier.

I cannot share this opinion, which is unfortunately very common and often expressed in literature. On the contrary, I claim that only Harvey, on the ground of certain premises, was in a position to discover the lesser circulation and to conceive its principles.†

†Harvey did not make known the full experimental proof until 1651; he writes in a letter to Slegel, a physician in Hamburg, that he succeeded in forcing water from the pulmonary artery into the pulmonary vein and the left ventricle.

A simple consideration shows that a clear conception of the lesser circulation is unthinkable without the knowledge of the greater circulation. Both constitute one. It seems hardly possible that anybody could have imagined the small circulation without associating with it simultaneously the idea of the large circulation. The concept *pulmonary circulation*, of course, is always to be understood in Harvey's meaning, that is, *that the total blood flows from the right ventricle through the lungs into the left.**

If Servetus and Realdus Columbus really discovered the lesser circulation it would be a priori inconceivable that they did not also realize the existence of the systemic circulation. For where else could the *total blood* which had poured into the left ventricle from the lungs, flow off but into the aorta and into the arterial system? Whence could the total blood which entered the pulmonary artery and the lungs from the right ventricle have come but from the venous system?

Both Servetus and Realdus Columbus adhered to Galen's doctrine, which states that the blood is prepared in the liver and that *most of it flows into the right ventricle and from here into the veins.* Was this doctrine still compatible with the discovery of the lesser circulation, that is, with the recognition of the fact that the total blood flows from the right ventricle through the lungs into the left? Certainly not.

Neither Servetus nor Realdus Columbus taught that the total blood goes through the lungs. How else could they have maintained the erroneous ancient theory that the main part of the blood flows from the right ventricle through the veins to the various parts of the body? Servetus and Realdus Columbus rejected only the portion of Galen's hypothesis which says that *a small part* of the blood which had entered the right ventricle penetrates the septum to be transformed into *spiritus vitalis* in the left ventricle. Both authors showed that blood could not pass

*Harvey's lecture notes of 1616 show that as early as that year he conceived the small and the large circulation as a whole.

"W. H. constat per fabricam cordis sanguinem
per pulmones in Aortam perpetuo
transferri, as by two clacks of a water bellow to rayse water
constat per ligaturam transitum sanguinis
ab arteriis ad venas
unde Δ perpetuum sanguinis motum
in circulo fieri pulsu cordis . . ."

Translator's Note: These lecture notes were written twelve years before the publication of *De Motu Cordis.* W. H. are Harvey's initials which he is supposed to have put opposite statements he considered original. The delta in the line before the last stands for "it is demonstrated."

through the septum, that it has to take its way through the pulmonary artery, the lungs, and the pulmonary vein. However, what they had in mind *was not the total blood but only that part of it which was supposed to be turned into spiritus vitalis.*

No mention is made either by Realdus Columbus nor by Servetus of the small circulation as explained by Harvey, who based his doctrine upon the fact that the total blood circulates. Columbus deals extensively in the second chapter of the eleventh book of his work *De Re Anatomica* with the function of the lungs, which is to prepare for the production of the spirits of life. He says there: *Aërem namque per nares et os inspiratum suscipit; nam asperae arteriae vehiculo per universum pulmonem fertur pulmo vero aërem illum una cum* eo *sanguine miscet, qui a dextro cordis ventriculo profectus per arterialem venam deducitur."* The demonstrative pronoun preceding the word *sanguine* shows that Columbus did not consider the total blood but *merely part of it.*

Harvey was the *discoverer* not only of the greater but also *of the lesser circulation.*

PLASMA AND SERUM TOXICITY DUE TO A AND B SUBSTANCES

MILTON GJELHAUG LEVINE, M.S., Ph.D.
Chicago, Illinois

and

DAVID STATE, M.D.
Minneapolis, Minnesota

IN previous publications,[4,5] we have reported reactions following the transfusion of group specific plasma. Some of these reactions were shown to be due to soluble A and B substances which Schiff[6] first demonstrated to be present in human serum. We have recently encountered one patient sensitive to both A and B substances, whereas the others, we have observed were sensitive only to one or the other of these factors. This case permitted a study of the effect of pooling on the sensitivity to the A and B factors.

P. C., aged forty-three, blood group O, diagnosis inguinal hernia. Repeated skin tests to A and B purified substances and to A, B, and AB plasma were positive. O plasma gave a negative skin test. On September 10, 1942, he received 100 c.c. of undiluted type A plasma intravenously. After approximately 20 c.c. had run in, the patient developed a generalized erythema, epiphora and dyspnea. The skin became cool and moist. The blood pressure dropped from 130/60 to 104/60. The pulse became rapid and weak. These symptoms were allowed to continue for about ten minutes. He was then given 0.5 c.c. of 1/1000 adrenaline hydrochloride intramuscularly with rapid relief. On September 11, 1942, the patient was given 100 c.c. of undiluted O plasma without reactions. On September 12, 1942, skin test to pooled equal parts of A and B plasma were positive, as were also the skin tests to a commercial pool of serum* containing 9 group O, 8 group A, 3 group B, and 1 group AB serums. Subsequent transfusion with the pooled serum giving the positive skin test resulted, after 10 c.c. had been given, in generalized erythema, epiphora, dyspnea, a fall in blood pressure and a rapid pulse. These symptoms were relieved again by the intramuscular injection of 0.5 c.c. of 1/1000 adrenaline hydrochloride. As a control, 100 c.c. of the same serum pool was given to a non-sensitive patient without reactions.

As suggested in an editorial[3] in the *Journal of the American Medical Association,* we skin-tested this patient on September 22, 1942, with pooled A and B plasma in the ratio of 5:1 and 2:1. The skin tests in both these dilutions remained positive. We were, however, unable to transfuse this patient with plasma in the above ratios at this time.

The results obtained in this case confirm our previous observations[5] that pooling does not neutralize the skin reacting substance, nor, necessarily, the transfusion reaction properties of the A and B factors. It also demonstrates that no single ratio of plasmas or serums in a pooled specimen, as suggested by Aubert and his associates[1] is sufficient to neutralize the reacting substances.

From the Cook County Hospital and the Department of Bacteriology and Public Health, University of Illinois, Chicago (Levine) and the Department of Surgery, University of Minnesota (State).

*Obtained from Human Serum Center, University Hospital.

It is possible at this time to summarize the evidence for the existence of A and B factor sensitivity as observed in cases reported previously and some as yet unpublished:

1. Individuals with A or B isoantibody are occasionally found to be sensitive to the corresponding A or B substance present in plasma or serum.

2. Individuals sensitive to these factors evidence this sensitivity by repeatedly positive skin tests to different samples of group specific plasma or serum of a blood group containing the reacting substance, but not to plasma or serum of the other groups.

3. These individuals also show their sensitivity by reacting to intravenous administration of different samples of group specific plasma and serum containing the specific reacting substance (A or B factor) but not to other plasmas or serums.

4. These individuals are sensitive by skin test and by intravenous administration to the chemically purified A and B substances developed by Witebsky and his co-workers.[7] These same substances give no reaction either dermally or intravenously in non-sensitive individuals.

We have run adequate controls including dividing many of the testing fluids into two portions, giving one to sensitive and one to non-sensitive individuals. Thus pyrogens and other non-specific factors are further eliminated as a possible cause of reactions.

The results of pooling are as yet unexplainable, since we have demonstrated as have others, the combination of isoantibody and the dissolved substances in pooled plasma as evidenced by the disappearance of the isoantibody. We must conclude that either combination does not neutralize the reacting substance or that the combination is not quantitatively exact enough to cause complete neutralization.

We want to emphasize that plasma and serum are still the best blood substitutes, and that plasma is saving a tremendous number of lives on the battlefield; our work is intended to eliminate the relatively few reactions which occur. There can be no doubt that they do occur, the most recently reported being due to dried pooled plasma.[2] It is also apparent from our work that the A and B factors constitute only one cause of transfusion reactions due to plasma and serum. The other types encountered will be described elsewhere.

References

1. Aubert, E. F., Boorman, K. E., and Dodd, B. E.: The agglutinin inhibiting substance in human serum. J. Path. and Bact., 54:89, 1942.
2. Downs, T. McKean: A reaction of dried pooled human plasma. U. S. Naval M. Bull., 41:189, 1943.
3. Editorial: Toxicity of human plasma. J.A.M.A., 120:206, 1942.
4. Levine, M., and State, D.: Skin sensitivity to human plasma. Science, 98:68, 1942.
5. Levine, M., and State, D.: A. and B. substances as a cause of reactions following human plasma transfusion. J.A.M.A., 120:275, 1942.
6. Schiff, F.: Die Blutgruppen und ihre Anwendungsgebiete. Berlin, 1933.
7. Witebsky, E., Klendshoj, N., and Swanson, P.: Reduction or elimination of the anti-A antibody in O blood by means of the addition of the "A" specific substance. J. Inf. Dis., 67:188, 1940.

PROBLEMS ENCOUNTERED IN EXPLAINING CERTAIN CASES OF ERYTHROBLASTOSIS FETALIS ON THE Rh THEORY

AMBROSE J. HERTZOG, M.D., Ph.D.

Minneapolis, Minnesota

THE etiology of erythroblastosis fetalis has long been an etiological puzzle. Darrow[1] in 1938 thought that an antigen-antibody reaction offered the best explanation for the disease. This would account for the frequent familial tendency; the apparent health of the parents; the fact that the first child of the marriage was usually normal; and the clinical and postmortem findings. Levine and Stetson[7] in 1939 described a transfusion reaction in a woman previously never transfused but who had delivered a macerated fetus. They suggested that an immunizing property in the blood and tissues of the fetus must have been responsible for immunizing the mother, as the usual blood groups were compatible. The Rh factor was described by Landsteiner and Wiener[3] in 1940 as a new agglutinogen in the red cells of humans. The relationship between the rhesus monkey antigen and the Rh factor of human blood has not been explained. The theory offered

From St. Barnabas Hospital and the Department of Pathology of the University of Minnesota Medical School.

TABLE I. DISTRIBUTION OF R_h FACTOR IN POPULATION

Author	No. Cases	Rh Positive	Rh Negative
Levine[4] 1941	1,035	86.0%	14.0%
Wiener[9] 1942	777	86.6%	14.4%
Fisk and Ford[2] 1942	927	85.0%	15.0%
Total	2,739	85.8%	14.3%

by Philip Levine and Alexander Wiener to explain erythroblastosis is as follows. The Rh factor is inherited as a Mendelian dominant. If the father possesses the Rh factor at least 50 per cent of his offsprings will be Rh positive. If the mother lacks the Rh factor and the fetus is Rh positive, agglutinogens in the red cells of the fetus through a hypothetical break in the placental barrier may immunize the mother. The mother may then develop antibodies in her serum that are capable of passing through the placenta and destroying the baby's red blood cells. This blood destruction leads to the clinical and pathological picture of erythroblastosis.

During the past three years, Levine and Wiener have gathered convincing evidence to support their theory. Table I shows the distribution of the Rh factor in 2,739 people taken from the general white population as determined by three independent investigators. It is seen that approximately 85 per cent of the white population is Rh positive. Levine[5] found that 93.7 per cent of American negroes and 92.2 per cent of American Indians were Rh positive. In 150 Chinese tested, 99.3 per cent were Rh positive. One would expect erythroblastosis to be rare in these races. Table II shows the distribution of the Rh factor as found by Levine and Wiener in 178 women who had given birth to erythroblastotic infants. The fact that only 12 per cent of these mothers were Rh positive as compared to 85 per cent of the general population is very significant. Moreover it shows that all cases of erythroblastosis cannot be explained on the Rh theory as 12 per cent of the mothers were Rh positive. The following case is reported as it illustrates the difficulty encountered in explaining certain cases of erythroblastosis on the Rh theory.

TABLE II. DISTRIBUTION OF R_h FACTOR IN MOTHERS OF BABIES WITH ERYTHROBLASTOSIS

Author	No. Cases	Rh Positive	Rh Negative
Levine[4] 1942	153	8%	92%
Wiener[9] 1942	25	16%	84%
Total	178	12%	88%

Case Report

A full-term infant was delivered at St. Barnabas Hospital on February 3, 1943. This was the mother's third pregnancy. The first child was living and well and was six years of age. The second pregnancy resulted in a macerated stillbirth that was delivered near term. An autopsy by the Pathology Department of the University of Minnesota was done. The findings on the stillbirth were those of erythroblastosis fetalis. This third pregnancy was normal and full term. Serological tests on the mother's blood were negative for syphilis. The delivery was easy. At birth, the baby weighed six and a quarter pounds and was jaundiced. The placenta was not remarkable. A Rytz test on the cord blood was negative for syphilis. The baby remained jaundiced and expired approximately fourteen hours after birth.

Postmortem examination was carried out seven hours after death. The body was well developed. There was a generalized deep jaundice but no edema. The liver and spleen were greatly enlarged. The liver weighed 230 grams and the spleen, 30 grams. The sternal bone marrow was deep red in color. The brain showed extensive postmortem changes but no discoloration. The remaining gross examination showed no departures from normal. Microscopically, the findings were those of erythroblastosis. Postmortem blood smears showed large numbers of normoblasts with a leukemoid reaction in the granulocytes. The sternal bone marrow showed hyperplasia with many nucleated red blood cells and considerable myeloid immaturity. The sinusoids of the liver were dilated and filled with nucleated red blood cells. Some areas showed large nests of normoblasts. There were persistent areas of hematopoiesis scattered throughout the pulp of the spleen. The splenic sinuses were filled with nucleated red blood cells. The follicles had largely disappeared. The remaining organs showed nothing of note. The anatomical diagnosis was erythroblastosis fetalis of the icterus gravis type.

The following serological studies were carried out. The anti Rh typing serum used was obtained from Philip Levine of Newark, New Jersey. It was prepared from a mother who had given birth to an erythroblastotic infant and the agglutination titre was high. Levine[6] stated that the serum was the standard variety of typing serum and by its use 85 per cent of the population reacted positive. The technique used was the warm agglutination method as recommended by Levine. Positive and negative controls were used. These controls were

TABLE III. SEROLOGICAL STUDIES OF REPORTED CASE OF ERYTHROBLASTOSIS

	Rh Status	Blood Group
Father	Rh positive	B
Baby	Rh negative	B
Mother	Rh negative	A
	Mother's serum contained no anti Rh antibodies	Mother's serum contained anti B agglutins at dilution of 1 to 26

red blood cells from the laboratory staff who are known to be Rh positive and Rh negative. The reactions in all cases were definite and read with no difficulty. The results were as follows. The father was found to be Rh positive and the mother, Rh negative. The baby was Rh negative. Anti Rh agglutinins could not be demonstrated in the serum of the mother as her serum failed to agglutinate the cells of an Rh positive individual of the same blood group. The father and baby were both group B (Landsteiner). The mother was group A (Landsteiner). The mother's serum agglutinated the baby's red cells at a dilution of one to twenty-six. This is a normal agglutination titre for typing serum. Table III is a summary of the serological findings.

Discussion

The fact that the baby in this case proved to be Rh negative would not allow this case of erythroblastosis to be accounted for on the Rh theory. It is recognized that objections can be raised against the serological findings in this case as several bloods inactive with a particular typing serum have been reported to react positive with another serum. The existence of recently reported subdivisions in the Rh agglutinogen makes the matter more complicated. Philip Levine[6] stated that the human typing serum used in this case can be called the standard Rh 1 variety as 85 per cent of the population were found to react positive by its use. Levine[5,8] found a second type of anti Rh serum to give 72 per cent positives. A mixture of types one and two gave 87 per cent positives. A third type of anti Rh serum also gave 87 per cent positives. This third type of serum was called Rh 12 as the results obtained were the same as those from a mixture of types one and two. In addition, he has found a few human sera from mothers of erythroblastotic infants which give divergent reactions with rare bloods, indicating the possible existence of still further varieties of the Rh agglutinogen. Levine[6] suggested that the baby in this case might fall in the 2 per cent missed by the use of the standard, Rh 1, typing serum. The use of animal serum in infants would appear unreliable as Fisk and Ford[2] found immunized guinea pig serum to show 100 per cent positives when tested against red cells of infants. In adults, they found this same serum to give comparable results with human serum. The lack of anti Rh agglutinins in the serum of the mother in this case is of little importance as the anti Rh titre of the mother's serum in erythroblastosis may fluctuate greatly. This is why it is difficult to secure reliable typing serum from humans. Levine, Burnham, Katzin, and Vogen[8] found anti Rh antibodies present in only 50 per cent of the mothers who had given birth to erythroblastotic infants when their sera were tested within two months after delivery.

The fact that the baby and mother in this case belonged to different blood groups would offer a basis for isoimmunization, although the anti B titre of the mother's serum was not elevated. An objection to this is the fact that in 80 per cent of the population, the A and B agglutinogens are not confined to the red blood cells alone but are also present in various fluids and tissues of the body. This multitude of antigens would protect the red cells from injury by any intrauterine antibodies formed by the mother. However there remains 20 per cent of the population where the A and B agglutinogens are found only in the red blood cells. In the latter group, especially if an elevated antibody titre is present a theoretical basis for isoimmunization exists. Levine[5] is hard pressed to explain certain cases of erythroblastosis on the Rh factor. He suggests the possibility of another factor, Hr, being involved in those cases where the mother is found to be Rh positive. The subject of isoimmunization becomes extremely involved and complicated when one realizes that Wiener[10] by means of five agglutinogens, A 1, A 2, B, M, and N and the two common varieties of anti Rh agglutinins recognizes seventy-two distinct types of human blood.

Conclusion

The majority of cases of erythroblastosis fetalis can be explained on the Rh antigen-antibody mechanism. Other known and unknown factors related to isoimmunization may be involved in those cases that fail to meet the requirements of the Rh theory. The field of isoimmunization is a

(Continued on page 1089)

CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL

A. J. Hertzog, M.D., and S. V. Loisness, M.D.
Pathologists

Presentation of a Case

A-43-1797

Dr. Petit: This case is that of a fifty-eight-year-old female who was first admitted to the Medical service on September 25, 1942, complaining of shortness of breath and marked weakness. Her past history was essentially negative except for some recurrent nosebleeds at the age of thirty-eight. Her present illness began approximately one and one-half years before admission to the hospital. At that time she had an upper respiratory infection with gastro-intestinal symptoms. Her physician found her anemic; her hemoglobin was 60 per cent (Sahli). She was treated with iron and liver, and the hemoglobin rose to 70 per cent. She did not return to her physician until a year later and approximately three months prior to her admission here. She was complaining of weakness and dyspnea on exertion. The hemoglobin at that time was about 30 per cent. A gastric expression showed free hydrochloric acid. She was given injections of liver extract three times a week, and, failing to improve, was referred to the hospital.

Physical examination on admission showed her to be somewhat obese and very pale. The tongue showed atrophy of the papillæ along the sides. The heart was enlarged to the left. There was a systolic murmur, present over the apex. The spleen was not palpable. The liver was moderately enlarged. The pulse was 88 per minute, temperature was normal, and blood pressure 140/70. There was slight edema of both ankles. There was no peripheral adenopathy. The hemoglobin was 20 per cent (Sahli); red blood count, 800,000; white blood count 3,000. The differential was made up of neutrophiles 27 per cent, lymphocytes 69 per cent, and monocytes 4 per cent. The color index was 1.25. Reticulocytes 1.3 per cent; platelets, 62,000. The mean corpuscular volume was 131.1 cubic microns. The average mean diameter of the red cells was 9.3 microns. The icterus index was 4. No immature lymphocytes were observed. There was a right shift of the neutrophiles. The red cells were macrocytic, showed moderate anisocytosis, and a slight degree of polychromatophilia.

Attempts were made to transfuse the patient, but due to marked autoagglutination, the selection of a suitable donor was unsuccessful. Her serum proteins were studied and found to be elevated. Total plasma proteins were 9.21 grams with 4.81 grams of albumin, 1.62 grams of globulin, and 2.78 grams of fibrinogen. She developed areas of ecchymosis around the venapuncture wounds of her arms. Bleeding time varied from four to ten minutes and coagulation time was within normal limits. The prothrombin level was normal. Despite adequate antianemic therapy, she failed to improve and expired on October 8, 1943.

Dr. Hertzog: This is a case of severe macrocytic anemia that failed to respond to therapy. The peripheral blood picture suggests a failure of maturation of all the elements of the bone marrow, namely, red blood cells, granulocytes, and platelets. Does any one wish to venture a diagnosis?

Dr. Peterson: The blood picture to me would appear more like a severe stage of Addisonian pernicious anemia rather than an aplastic anemia. Wilkinson has described a type of pernicious anemia that fails to respond to therapy and suggested the name achrestic anemia.

Dr. Hertzog: The gastric expression showed free hydrochloric acid. I think one should be extremely hesitant in making a diagnosis of pernicious anemia when free hydrocloric acid is present, although a few authentic cases have been reported. Dr. Schleicher studied the blood smear and did a bone marrow aspiration. We will ask him to tell us what he found.

Dr. Schleicher: I might as well say at the start that I failed to interpret the hemopathology correctly. This is a very interesting case and I learned a lot from it. This is the highest mean corpuscular diameter that I have ever seen in a case of the type presented here. In addition to the refractory macrocytic anemia, we have a reduction of platelets, a lymphocytosis which was neither absolute nor was the nature of the lesion apparent from the morphology of the cells. No ruptured lymphoid cells were observed in the blood smear. We were only able to aspirate a small piece of tissue which, on histologic examination, was composed of mature lymphocytes, some neutrophiles, fibrin threads, macrophages and erythroid cells. No megaloblasts were observed in the smear preparation. Another unusual phenomenon was the unusually high plasma proteins. I have never seen this in uncomplicated pernicious or aplastic anemia. My conclusions were severe macrocytic anemia, not hemolytic in character, atrophy of the bone marrow organ, and liver injury.

Dr. Hertzog: On what basis do you make a diagnosis of liver damage?

Dr. Schleicher: The uniformity of size of the macrocytes and the presence of many macrophages filled with siderin and lipoid granules in the sternal marrow. These findings are usually associated with liver disease of long duration. An extract of the liver is being made.

Student: Was the spleen ever palpable?

Dr. Petit: The spleen was not palpable; however, the liver appeared enlarged.

Autopsy

Dr. Petit: The body was that of a pale obese female weighing approximately 190 pounds. There was a slight generalized pitting edema and a slight jaundice. The liver weighed 1,900 grams. It was enlarged, pale brown, and had a nutmeg appearance. The spleen was small, weighed 120 grams, and showed nothing of note. The heart weighed 480 grams. The myocardium showed the tabby-cat appearance we find in severe anemias. The lungs showed nothing other than slight edema. The kidneys were enlarged, the right weighed 300 grams, and the left, 250 grams. They were smooth, and had a pale brown color. The lymph nodes were not enlarged. The yellow bone marrow of the shaft of the femur was replaced by a bright red marrow.

Dr. Lofsness: The diagnosis in this case rests upon the microscopic sections. Sections of the liver show large collections of lymphocytes around the portal spaces. There is considerable hydropic degeneration and necrosis of the cells in the central portion of the lobules. Hence, Dr. Schleicher is right when he says there was considerable liver damage in this case. This may be an explanation for the macrocytosis. Lymphocytes around all of the portal spaces is the pattern found in lymphatic leukemia. We were unable to explain the changes in the central portions of the lobules. The kidneys show the picture of leukemia with large collections of lymphocytes scattered throughout the cortex. Sometimes this process can be so profuse as to cause uremia. The bone marrow from the femur shows solid sheets of small lymphocytes as seen in chronic lymphatic leukemia. The erythroid and myeloid elements are crowded out. If this pattern had been obtained on sternal aspiration, the diagnosis could have been established. The spleen shows a diffuse increase in lymphocytes scattered throughout the pulp. This is not the usual picture of lymphatic leukemia in the spleen as the follicles are not enlarged. A section of a lymph node shows diffuse hyperplasia of the lymphoid elements. However, some of the normal architecture of the node remains intact. No conspicuous immaturity of the lymphoid cells could be made out. The mucosa of the stomach is infiltrated with many lymphocytes and plasma cells, and the gastric glands are atrophic. This is the picture of chronic gastritis rather than of leukemia of the stomach.

Dr. Hertzog: This case shows how difficult it is at times to establish the diagnosis of lymphatic leukemia. This case falls in the category of aleukemic leukemia, which term is often used to describe those cases where no immaturity is demonstrable in the peripheral blood. We occasionally see hyperproteinemias and macrocytic anemias in leukemia. The atrophic gastritis was apparently not severe enough to produce an achlorhydria. The atrophic gastritis and liver damage offer an explanation for the macrocytosis.

Anatomical Diagnosis: (1) Chronic lymphatic leukemia; (2) chronic atrophic gastritis; (3) macrocytic anemia.

◆ CASE REPORTS ◆

SUCCESSFUL TREATMENT OF EXTREME ALLERGY TO BEE BODY AND BEE VENOM

EVELYN G. McLANE, A.B., M.D.

Jackson, Minnesota

The patient is a woman of forty-three, married, has five children, and is in general good health. At the age of seventeen she married an apiarist. She had frequent accidental bee stings, but never had any reactions until in 1923.

In 1923, a sting under a ring resulted in an asthmatic type of cough, and severe hives. The next reaction was in 1925, when a sting caused a sudden swelling of the upper eyelids. In 1935 the family moved their business of beekeeping from Texas to Minnesota. In the fall of 1935, she noticed symptoms which made her believe she was developing hay fever. But as soon as the bee season opened in the early spring of 1936, she found that as soon as any of the men who were working with the bees entered the house, she immediately started to wheeze, cough in an asthmatic way, had coryza, lacrimation, and at times developed large wheals about the face, neck and arms. This became more severe as the season advanced, and continued until the bees were disposed of and taken into the south for the winter.

When the season opened in 1937, the symptoms became nearly unbearable; and when an accidental sting occurred, she suffered intensely. In June of 1937, a near fatal episode occurred. In spite of precautions, she was accidentally stung by a bee. Within a few minutes after the sting, the patient was unconscious. On my arrival at the scene, a few minutes after the sting, she appeared very blue, the face was puffy, she was entirely unaware of her surroundings, the pulse could not be felt, and the blood pressure was so feeble that it could not be determined. The entire body was covered with massive wheals, some over 12 inches in diameter. It was impossible for her to take in any air, as the glottal region was either so swollen, or in such spasm, that breathing was not possible. The only evidence of life was a futile expansion and contraction of the thoracic barrel, in an effort to breathe. The patient appeared like a body that had been submerged in water for several days. Repeated doses of adrenalin and strychnine, and heat to the body brought the desired results, and in a short time, she was conscious. Allergy symptoms were present for several days.

It was apparent then that she had to leave the family for the entire honey making season and hope to avoid a bee sting in every contact of life, or that her husband would have to change his life-long occupation, or that some medical help would have to make it impossible for such reaction to recur. It did not seem possible that a reaction of any more severity could have any result but death.

TABLE I

Date 1939	Dosage: Minims	Dosage: Dilution	Reaction
June 13	1	1:10,000,000	Severe
15	4	1:5,000,000	Severe
17	3	1:1,000,000	Moderate
19	4	1:500,000	Moderate
22	1.5	1:100,000	
24	2.5	1:100,000	Mild
26	4	1:100,000	
28	6	1:100,000	
30	9	1:100,000	
July 3	14	1:100,000	Mild
5	21	1:100,000	Moderate
7	3.5	1:10,000	Moderate
10	5	1:10,000	
12	8	1:10,000	
15	13	1:10,000	
18	20	1:10,000	
20	30	1:10,000	
22	4.5	1:1,000	
24	8	1:1,000	
26	14	1:1,000	
28	24	1:1,000	
31	30	1:1,000	
Aug. 2	8	1:500	
4	14	1:500	
7	20	1:500	
9	25	1:500	
12	30	1:500	
19	20	1:500	
21	30	1:500	
23	40	1:500	

Adrenalin was given for the reactions June 13, 15 and July 5. Very mild hay fever symptoms followed the injection August 23.

TABLE II

Date 1939	No. of Stings	Data of Symptoms Following Stings
Aug. 26	1 sting	Symptoms as listed above
Sept. 2	1 sting (brief)	In 3 minutes pulse rose from 80 to 100 In 3 minutes face flushed, itching In 12 minutes blood pressure was 127/80. Coughed In 16 minutes pulse was 132, BP 108/60. Wheezed In 18 minutes pulse was 144 In 21 minutes pulse was 124 BP 108/60 In 40 minutes pulse was 116, BP 114/64 In 60 minutes pulse was 90, BP 115/76. Felt better
Sept. 9	1 sting (brief)	Reactions similar, but less severe
Sept. 16	Full sting	Reactions mild
Sept. 23	2 full stings	Reaction moderate, but pelvic pain as in advanced labor. Lasted 65 minutes.
Sept. 30	2 full stings	Very moderate symptoms

During the season of 1938, she remained cloistered in the house to avoid any danger of a sting, and suffered from spring until frost with intense hay fever, and a cough that made more than a few consecutive moments of sleep impossible.

One troublesome symptom that had occurred very frequently since the first reaction in 1923 was irregular uterine bleeding. Her periods were absolutely irregular, growing longer in duration, and at times hemorrhage was profuse. She had been advised by several physicians to have a hysterectomy. During the summer of 1936, she bled almost constantly. I could find no uterine abnormalities, except a very moderate subinvolution; not sufficient, I felt, to warrant the symptoms.

In considering treatment, I wrote the Mayo Clinic, and they replied that they had no experience in the problem but referred me to Dr. Robert L. Benson, of Portland, Oregon. Dr. Benson sent me a reprint of his study made following care of a similar, but apparently less severe, case.[2]

I asked the Arlington Chemical Company of Yonkers, N. Y., to prepare an extract of whole bee body, which they did in dilutions of one part to 100,000 dilutent; one to 10,000; one to 1,000; and one to 500. They also sent me a vial of ground bee body for dermal test. Just to confirm the already obvious facts, I made a very superficial scratch about one-eighth inch long on the forearm, and placed a drop of water solution of bee body on the scratch. Within a minute, she had a large wheal on the spot, and developed hay fever symptoms.

Before starting treatment I ran a series of scratch tests for possible reactions to pollens common in this part of the country; namely, for elm, cottonwood, thistle, orchard grass, small and giant ragweed, amaranthus, blue grass and prairie sage. All were negative except elm, which was markedly positive. She said she had what she considered a cold every year in the spring, corresponding to the time when pollen is given off from the elm. Yearly observation since has confirmed that she has hay fever during the brief period that the elm pollenizes. The brevity of this annual period made it seem unimportant to trouble with desensitizing for elm.

I started subcutaneous injections of the bee extract on June 13, 1939, giving 1 minim of 1 to 10,000,000 dilution. She reacted with a moderate asthmatic cough, wheezing, severe facial wheals, agonizing itching, and vaginal bleeding which started within one-half hour of the injection, and lasted one day. The discomfort was severe enough to warrant administering adrenalin. Injections were continued, as indicated in Table I until August 23, 1939, when the last extract was given, with a dosage of 40 minims of 1 to 500 dilution. She showed a very mild reaction. With each injection she developed a scant vaginal bleeding which lasted from a few minutes to a full day. After reactions from injections subsided, she always fell into a deep sleep for about one hour. The onset of vaginal bleeding was always accompanied with pelvic pain, which she described as feeling like true labor pains.

I had exhausted the supply of bee extract and, since the desire was to make it possible for her to be able to take actual stings with safety and moderate comfort, I felt it was time to try an actual sting. On August 26, 1939, I asked her to bring a bee to the office. This was seventy-four days after the beginning of treatment. I loaded a syringe with adrenalin, as neither the patient nor myself was very confident of what was about to happen.

When a bee stings, the entire venom mechanism of the bee's body is cast off with the stinger, and an ejaculatory movement in the mechanism gradually propels the venom into the victim. The stinger should not be grasped between the fingers when pulled out of the skin, as this squeezes in more venom; rather the stinger should be brushed off in the direction opposite to which

it is thrust in. My intention was to allow the bee to insert his stinger and brush it off at once, thus giving her as small a dose of venom as possible. The bee did not behave according to ritual, and, though the patient thought she felt a prick, no stinger was cast off. Finally the sting was consummated, the sac brushed off, and within two minutes three wheals appeared on her arm, indicating that she had actually been punctured in three places, thus probably getting much more venom than I had desired. In ten minutes her face flushed, and there was generalized pruritis. The conjunctivæ became severely engorged, and sneezing and coughing were severe. Edema developed in the eye lids and lips, and woodiness invaded the skin of the extremities. I gave her 3 minims of 1:100 adrenalin. Blood pressure before the sting was 118/70, and remained the same until twenty-five minutes after the sting, when it dropped to 80/55. Pulse rose from 80 to 130 within fifteen minutes. Vaginal bleeding started almost at once. Within one hour general symptoms subsided, and she went to sleep. Stings were repeated as listed in Table II at about weekly intervals, with reactions gradually becoming less.

The patient felt that reactions were becoming of a mild enough nature so that she could take them herself at home. We returned to the one-sting procedure. Within one more month, she was free from reactions of any sort after a full sting. This was four and one-half months after the beginning of treatment. She also had no allergic type of reactions when about those of her family who had been working among the bees.

The problem then was to determine how permanent this desensitization would prove. She experimented with varying intervals between stings, and has found now, nearly four years after the procedure, that during the winter she does the best and is free from reactions, if the stings are taken every two weeks. During the actual bee season, she finds it best to take them every week. This spring, due to labor shortage, she is needed to work directly with the bees, and is getting along without any discomfort. When stings were spaced three or four weeks apart, she occasionally experienced a mild discomfort. Accidental stings do not trouble her.

Benson[2] made a detailed study after treating an apiarist, using material prepared from water-soluble stinger protein and body protein. His patient is reported as having a mild residual hay fever upon contacting his bees. In his paper, he considered the problem under three heads: (1) complications caused by venom, itself; (2) those caused by plant pollens carried by bees; (3) allergy caused by allergens inherent in bees.

Considering venom, itself, it has been shown that the venom of all hymenopteræ have much in common, both chemically, and in clinical manifestations.[5,6] My patient has never experienced any unusual reaction from other hymenopteræ, such as wasps. It was shown by Langer[10] that there is no formic acid in bee venom, and he believed it to be protein free. Flury[8] considered it to be a protein-free material. Arthus[1] and Lyssy[11] both call the poisonous component of bee venom a proteotoxin. Benson[2] caused contraction of the virgin guinea pig uterus by injecting very minute quantities of diluted venom. Cushney[4] and Wells,[12] as well as others, describe the histamine-like reactions of various venoms, and point to the fact that adrenalin is the natural antagonist of histamine.

As to pollen being carried by bees, and hence the bee only serving as a vehicle, it was proved by Benson[2] that the stinger is usually pollen free. Gibb[9] reports a case that he ascribes to bee-borne pollen, but he is not convincing, as his patient had no history of sensitivity previous to a bee sting, and to nothing aside from the sting at a later date.

Considering the inherent allergen in bees, it seems a suggestion might be entertained that both bee body and bee venom might carry some common denominator that is capable of sensitizing a person. The case here reported reacted badly both to stings and to persons or material that had been in the environment of bees.

An interesting report is made by Fisher[7] on treatment of bee allergy by using whole bee extract. Braun[3] reports a patient having labor-like pains, but describes no vaginal bleeding.

Conclusions

1. The study of only one case can do little more than stimulate lines of thought.

2. Bees and their venom may have a specific factor not common to all hymenopteræ, as this patient's reaction was specifically to bees.

3. It is possible to attain desensitization in cases of bee allergy by graduated injections of whole bee extract, followed by carefully spaced bee stings.

4. Desensitization is not necessarily permanent, and may require a continuous follow-up of a routine of administration of venom through bee stings.

5. Since bee stings protect the patient from reaction both to venom, and to any dust or substance thrown off from the bee body, it would appear that there is a common substance present both in the venom and in the body.

6. I am told by apiarists that there is some prevalence of allergy symptoms among those who are keepers of the bee. It might be well to include the bee test in efforts to diagnose the etiological factor in case of sensitivity, especially in rural areas where many farmers cultivate a few hives of bees.

Bibliography

1. Arthus: Cited by Wells; Chemical Pathology. Ed. 5, p. 151. Philadelphia: W. B. Saunders Co., 1925.
2. Benson, Robert L., and Semenov, Herman, A. B.: Allergy in relation to bee sting. J. Allergy, 1:105, (Jan.) 1930.
3. Braun, L. I. B.: Notes on desensitization of a patient hypersensitive to bee stings. South African M. Record, 23:408, (Sept. 26) 1925.
4. Cushny, Arthur R.: Pharmacology and the Therapeutic Action of Drugs, p. 388-393. Philadelphia and New York: Lea and Febiger, 1924.
5. Feldberg, W., and Kellaway, C. H.: Circulatory effects of the venom of the India cobra in cats. Australian J. Exp. Biol., 15:159-172, (Sept.) 1937.
6. Feldberg, W., and Kellaway, C. H.: Liberation of histamine and its role in the symptomatology of bee venom poisoning. Australian J. Exp. Biol. and Med. Sci., 15:461-489, (Dec.) 1937.
7. Fisher, Daniel C.: Hypersensitivity to bees successfully treated with whole bee extract. J. Allergy, 5:519, 1934.
8. Flury, F.: Über die chemische Natur des Hienengiftes. Arch. f. exper. Path. u. Pharmakol., 85:319, 1920.
9. Gibb, Douglas F.: Anaphylaxis from pollen introduced by bee sting. Canadian M.A.J., 19:461, 1928.
10. Langer, Josef: Über das Gift unserer Honigbiene. Arch. f. exper. Path. u. Pharmakol., 38:381, 1897.
11. Lyssy, R.: Experimental studies on the poison of the bee. Arch. Int. Physiol., 16:272, 1931.
12. Wells, H. Gideon: Chemical Pathology. Ed. 5, p. 151. Philadelphia: W. B. Saunders Co., 1925.

COMMON DUCT REPAIR BY MEANS OF A VITALLIUM TUBE

JAMES M. HAYES, M.D.

Minneapolis, Minnesota

INJURY to or destruction of the common duct may follow cholecystectomy, ulcerations from stones, or infection of the ducts. To restore the duct to normal function has been a great problem of the surgeon.

The ordinary benign stricture may be dilated and a T tube inserted and left in place for weeks or months. Many of these will require no further treatment. Some of them will promptly become constricted again. Resection of the stricture with end to end anastomosis may give good results. A rubber tube may be passed through the duct into the intestinal tract and be allowed to remain there permanently.

The proximal end of the common duct has been transplanted into the duodenum, stomach and jejunum. When the greater part of the common duct is gone and an external biliary fistula exists, the fistula has been dissected out and transplanted into the intestinal tract. A long tube through the duct into the intestine may give rise to a secondary infection from the intestinal tract. Without the tube or something to keep the duct patent, strictures usually recur at the sight of anastomosis. No existing method of surgical treatment of these conditions has been eminently satisfactory.

Pearse[2] has suggested the use of a vitallium tube buried in the duct at the sight of anastomosis or stricture to be left there permanently. The use of vitallium steel plates in bone work established the fact that vitallium is practically inert in the tissues.

In February 14, 1941, Pearse reported five cases treated by burying a vitallium steel tube in the tissues for relief of common duct strictures. Previously rubber tubing had been used for this purpose but was not considered practical for permanent use. Cases have been cited in which rubber was known to have functioned satisfactorily for six years but as a rule the fear has been expressed that it would rot in a rather short period of time.

The tube used by Pearse was made with an internal diameter of 5 mm. and a length of 4 cm. The edges were flared slightly to aid in retaining it in place.

Pearse recommended that this tube be used only in the cases which could not be otherwise satisfactorily treated. One of his cases reported one year after operation seemed satisfactory.

Case 1.—The first case in which I used this tube was a very unusual one. The patient was a female, forty-three years of age, a school teacher. She said she had had her gallbladder drained about ten years previously. At that time she had been deeply jaundiced, had had clay-colored stools and much bile in the urine.

On December 15, 1941, the gallbladder was explored.

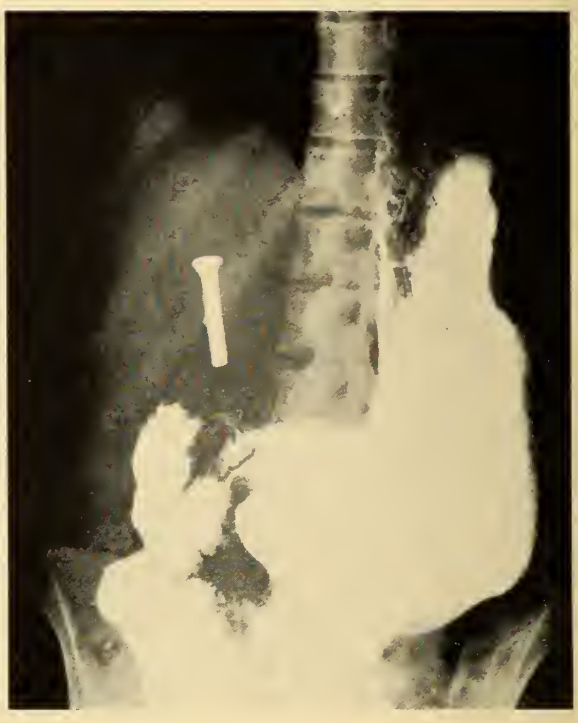


Fig. 1. Vitallium tube in common duct. Stomach and duodenum filled with barium.

It was completely filled with two large stones and had apparently ulcerated into the duodenum in two places. This functionless, apparently, dead gallbladder was removed and the openings in the duodenum repaired. A careful search revealed no common duct below the site where the cystic duct had been ligated and severed. Our conclusion then was that at the previous operation the gallbladder had been anastomosed to the duodenum and when the gallbladder became blocked there was no channel to carry the bile into the duodenum.

The proximal stump of the common duct was then pulled down to the duodenum and the two were anastomosed over a rubber catheter. With the exception of some pancreatic and bile drainage everything seemed to go well for about two weeks. Then for some reason the patient again became jaundiced, had clay-colored stools and other definite signs of complete blockage of bile to the intestine.

Shortly before this time Pearse's vitallium tube had been on exhibition at the American College of Surgeon's meeting in Boston. Something had to be done to relieve the obstruction here. Before exploring the patient again I got one of these vitallium tubes. On exploration, the rubber tube seemed to be still in place and the anastomosis holding quite well. Apparently the rubber tube had become blocked by the bile salts. Since the rubber tube had become blocked in such a short period I felt that the vitallium tube might become blocked in the same manner, so I left the rubber tube in place and put the vitallium tube in beside it. Bile began to appear in the stool and normal function seemed to be restored. Drainage from the wound continued for a

Presented before the Minneapolis Surgical Society, December 3, 1942.

long time. Pancreatic juice in the drainage was evident from the skin erosion. To prevent further skin destruction two catheters were inserted into the wound. Through one catheter a solution consisting of one part 1/10 normal hydrochloric acid (U.S.P.) and two parts strained beef broth was instilled by the gravity, drip method. Through the other tube the water suction pump carried away the fluid from the wound. The wound finally closed and the patient is apparently well with both rubber catheter and the vitallium tube in the common duct. She began her work as a school teacher three months after the operation and is apparently having no digestive or other disturbance now. This was done about one year ago.

Some time after this patient recovered, Dr. Donald, assisting Dr. Walters, at the Mayo Clinic, called attention to a very ingenious method of caring for the pancreatic fluid escaping from the wound. A small, standard sputum cup was obtained and the bottom cut off. The cup was then strapped to the wound so that the fistula opened in the middle of the cup. A thick ointment composed of 50 per cent glycerine and 50 per cent koalin was applied to the inside of the cup and to the skin adjacent to the fistula, and the fluid aspirated from the cup at hourly intervals. This method seemed much more convenient for the patient and the nurse than the method we had used.

Case 2.—A man, fifty-six years of age, had had his gallbladder removed six years previously. Soon after his cholecystectomy he became jaundiced and showed definite symptoms of obstruction to the common duct. The common duct was explored and found to be completely shut off at the site of the previous operation. The duct was opened and a T tube inserted and left in place for two or three months. The tube was then removed, the wound closed and the patient had no trouble for six years. He then became jaundiced, had clay-colored stools and all the symptoms of a complete obstruction of the common duct.

March 17, 1942, the common duct was again explored. The stricture extended down to the duodenum. A forty-day catgut suture was put around the upper end of the tube just below the phlange to hold it in place. The common duct was closed as nearly as possible and the wound closed about a split tube drain. Again we had some pancreatic drainage and skin excoration. This was treated as before described. The patient recovered promptly and has had no trouble since.

As Pearse has stated, this procedure should be preserved for cases that have failed wtih other methods.

This type of tube has not been used long enough to determine its real value. So far it seems to serve the purpose well.

References

1. Donald, C. J., Jr.: A simple apparatus for the treatment of upper intestinal fistula. Proc. Staff Meet. Mayo Clin., 17:156, (March 11) 1942.
2. Pearse, H. E.: Benign stricture of bile ducts treated with vitallium tube. Surgery, 10:37-44, (July) 1941.

REINFECTION WITH PNEUMOCOCCUS MENINGITIS

HERBERT I. ARBEITER, M.D.
and
MILTON GJELHAUG LEVINE, M.S., Ph.D.
Chicago, Illinois

ALTHOUGH many reports have appeared on clinical and experimental studies of reinfection in pulmonary pneumococcal infections,[1,2,3] relatively little is known as to the nature of the immunity in pneumococcal meningitis. Previously, this would have been an academic problem because of the exceedingly high mortality. In fact, recovery from the first infection was uncommon enough to justify case reports.[4,5,6,7] With the advent of sulfonamide therapy, the mortality has dropped somewhat. It may now become possible to study reinfections with pneumococcus meningitis to compare the immunity in this condition with that of the pulmonary form.

We are reporting an instance of a reinfection with pneumococcus meningitis occuring within six months of the first infection. As far as we can ascertain, it is the only case of reinfection with spontaneous pneumococcus meningitis reported in the medical literature.

L. S., a thirty-four-year-old white man, first entered a private hospital on October 9, 1942 with a history of coma lasting for twenty-four hours. The onset was sudden. The patient was found unconscious at home when his wife returned after a few hours absence. Lumbar puncture at this hospital showed the following: initial pressure 440 mm., dropping to 200 mm. after 15 c.c. of cloudy fluid was removed. The fluid contained 1,000 leukocytes per cu. mm., 95 per cent of the polymorphonuclear type. The patient was given 5 grams of sodium sulfapyridine intravenously, and was transferred to the County Hospital on October 10, 1942. Here we found him irrational and maniacal. He was examined under sodium pentothal (250 mgm.) anesthesia. He displayed marked neck rigidity, positive Brudzinski and Kernig signs, and a temperature of 103.6° F. rectally. The spinal fluid contained 4,000 cells per cu. mm., predominantly polymorphonuclear leukocytes. The spinal fluid sugar was 68 mgm., chlorides 680 mgm., total protein 375 mgm. per 100 c.c. A bacteriological diagnosis of type 25 pneumococcus meningitis was made culturally. On the day of admission, the patient was given 5 grams of sodium sulfathiazole intravenously followed by 2 grams of sodium sulfadiazene every four hours beginning October 11. On this day he was also given 100,000 units of type 25 pneumococcus antiserum intravenously. On October 12, a further dose of 100,000 units was given. Marked improvement was noticeable immediately; the temperature fell by lysis reaching normal on October 25.

The patient was readmitted March 30, 1943, with a history of headache and vomiting for six hours, followed by the loss of consciousness for five hours. He was restless and uncontrollable. His temperature was 105° F. rectally, and he exhibited positive Brudzinski and Kernig signs. Because he was difficult to handle, the patient was given 7.5 grains of sodium amytal intravenously after which a lumbar puncture was done. The

From the Cook County Hospital, Chicago, and Department of Bacteriology and Public Health, University of Illinois.

spinal fluid contained 24,000 cells, predominantly polymorphonuclear. The Pandy was 4 plus. On the day of admission 5 grams of sodium sulfapyridine were given intravenously followed by two doses of 2 grams of this drug, with the final administration of 2 grams of sodium sulfadiazene intravenously every four hours. Cultures of the spinal fluid revealed a type 10 pneumococcus. Type 10 antiserum was given (150,000 units) on the second day of illness. On the fourth day improvement was apparent and the patient was then placed on oral chemotherapy. His temperature became normal on the fifth day and he was discharged as cured on April 12, 1943.

Summary

We have reported a case of reinfection with pneumoccocus meningitis six months after the first infection. A different type of pneumonia was present with each attack, type 25 and type 10. No otitis was evident, but the patient gave a history of a skull fracture two years before the first illness. The patient recovered both times after a combination of sulfonamide and antiserum therapy.

Bibliography

1. Carbonell, A. and Cook, E. L.: Pneumococcus meningitis report of a case treated with ethylhydrocuprein and Huntoon's antibody solution with recovery. Mil. Surgeon, 63: 718, 1928.
2. Cecil, R. L.: Immunization against pneumonia. Medicine, 4:395, 1925.
3. Finland, M. and Winkler, A. W.: Recurrences in pneumococcus pneumonia. Am J. M. Sci., 188:309, 1934.
4. Globus, J. H. and Kasanin, J. L.: Pneumococcus (Type IV) meningitis. J.A.M.A., 90:599, 1928.
5. Harkavy, J.: Pneumococcus meningitis recovery with serum therapy. J.A.M.A., 90:597, 1928.
6. Kolmer, J. A.: Intracarotid method of treatment for meningitis with recoveries. J.A.M.A., 96:1358, 1931.
7. Thomas, H. M., Jr.: Recurrent Type I pneumonia: serum treatment of two attacks one month apart. Am. J. M. Sci., 161:103, 1921.

REDUCTION OF HOSPITAL INTERNSHIP TO NINE MONTHS AS A WAR MEASURE

The Surgeon General of the Army and the Surgeon General of the Navy have now definitely agreed to a reduction of the internship to nine months, with deferment of one-third of the interns who hold reserve commissions for a second nine-month period in order that they may serve as assistant residents and one-half of these for a third nine-month period to serve as hospital residents.

The Hospital Committee and the Directing Board of the Procurement and Assignment Service as well as the Council on Medical Education and Hospitals of the American Medical Association believe that this program will provide better balanced and more adequate resident staffs for hospitals than the present program of twelve months' internship with no commitment on the part of the Army and Navy for further deferment of active duty for any interns who hold commissions. It will also eliminate the waste of medical manpower which has occurred in many hospitals during the three months overlapping of intern services occasioned by the maintenance of twelve-month internships with students graduating from medical schools and beginning internships at nine-month intervals. It will provide the armed forces with a considerable number of young medical officers three months earlier than under the present program.

From the educational point of view further reduction in the length of internships is regrettable but the exigencies of the situation seem to justify it, particularly since the educational value of the internship is adversely affected at the present time by the excessive number of interns in many hospitals during the overlapping period.

It is recognized that the reduction of the internship to nine months will raise problems of licensure in certain states. The Directing Board of the Procurement and Assignment Service hopes, however, that as a war emergency measure these states will accept nine months of internship plus three months of military service as meeting the requirements for licensure.

Upon request of the Directing Board of the Procurement and Assignment Service of the War Manpower Commission and by direction of the Executive Committee of the Federation an inquiry has been submitted to each state board as follows:

1. Will your Board approve a decrease in hospital internship from twelve to nine months for the duration of the war?

2. Will your Board accept subsequent service in the armed forces for those physicians who leave their internships at the end of nine months at such time as they may apply for license in your State?

3. Will your Board accept a continued training in civilian hospitals from the ninth to twelfth month for those physicians who are physically disqualified and, therefore, do not enter the armed forces?

It is hoped to publish in the October BULLETIN the replies and expressions of opinion regarding this matter from the several state boards of the United States.

It will be noted in the Educational Number of *The Journal of the American Medical Association*[1] that an internship is required for licensure in twenty-two states and the District of Columbia, Alaska, Hawaii and Puerto Rico. Six schools in the United States and four in Canada also require an internship for graduation. In Delaware and Pennsylvania the internship requirement has been reduced to nine months for the duration of the war.—*Federation Bulletin*, 29:257, (Sept.) 1943.

HISTORY OF MEDICINE IN DODGE COUNTY

BY JAMES ECKMAN
Rochester, Minnesota

and

CHARLES E. BIGELOW, M.D.
Dodge Center, Minnesota

(Continued from November issue)

Dr. Henry T. Turner (1837-1913) was born in the State of New York on July 16, 1837, the son of Henry Turner and Betsy McBride Turner.[255] Events of his early life are thus far unknown, but in 1862 he was graduated from the old Eclectic Medical College of Pennsylvania at Philadelphia.[40] He came to Kasson in October of 1875, and advertised that he treated chronic diseases and that he had cured fourteen patients suffering from asthma. He opened an office in Minneapolis in 1882, but soon returned to Kasson, where in 1883 it was reported[256] that he had found a "cure for consumption." He was licensed to practice medicine in Minnesota on December 31, 1883, by exemption,[40] and in 1884 and 1885 he was health officer of Kasson. At some date not now known he was married to Miss Abbey Potter, of Mower County, Minnesota. He probably was a Republican in inclination, for in April of 1884 he was chairman of a Republican party caucus of some sort.[257] He was one of several physicians who presented bills to the county for medical services given to the poor in 1884,[258] and in April of 1885 he was reappointed health officer of Kasson.

Early in 1889 Doctor Turner went to Walla Walla, Washington, where he resided for some years. By the year 1906 he was living in Seattle, and a few years later he became resident physician at the Washington State Veterans' Home at Port Orchard. He died in that institution on July 16, 1913, of "senile decay and cystitis" of several years' duration.[255,259] So far as is known, Doctor Turner never was a member of the Minnesota State Medical Society, although he may have been a member of the old Minnesota State Eclectic Medical Society, as Doctor Lee and Doctor Kermott were.

Dr. Curran Winfield Higgins (1849-1926), as has been said, practiced medicine for a while in Concord in 1876, soon after he had been graduated from medical college. He was born in Hebron, Jefferson County, Wisconsin, on September 16, 1849.[260] At the age of nine years he was brought by his father and mother to Minnesota, to a farm in Dodge County. The young man was educated at the old seminary in Wasioja and in the public schools. He spent the year 1870-1871 teaching school, and in October of 1872 entered the University of Minnesota. In that year he was married to Miss Retta E. Stockwell, of Fairpoint, in Goodhue County.[260] During his second year at the University of Minnesota Doctor Higgins studied medicine under the venerable dean of homeopathic medicine in Minnesota, Dr. William Huntington Leonard (1825-1907) of Minneapolis.[127] In the fall of 1874 Higgins enrolled in the Hahnemann Medi-

cal College and Hospital of Chicago, from which he was graduated on February 14, 1876.[100] He then returned to Concord for a very short time, and next removed to Corning, Iowa, where he stayed for three years.[260] The Territory of Dakota attracted him in about 1879, and he settled in Brookings in what is now South Dakota, where he established a general medical practice and conducted a drug store.[260] He was licensed to practice medicine in the Territory of Dakota on April 28, 1886.[100] Doctor Higgins seems to have stayed in Brookings for about ten years. In 1889 he returned to Minnesota, and associated himself with the medical department of the old Northwestern Life Association. He was licensed to practice medicine in Minnesota on October 4, 1889.[210] He lived at first at 3124 James Avenue South in Minneapolis; but by 1892 he was associated with the National Life Association of Hartford, Connecticut, with his office at 49 South Third Street in Minneapolis. In 1895 he was appointed state manager for an eastern life insurance company,[260] and on December 3, 1897, he was elected a vice president and medical director of the National Mutual Life Association of Minneapolis,[261] which later became the Northwestern National Life Insurance Company of Minneapolis. In 1898 Doctor Higgins became secretary and treasurer of the Minneapolis Savings Bank.

Doctor Higgins was connected with the Northwestern National Life Insurance Company until March 1, 1902, on which date he resigned.[261] He stayed in Minneapolis, however, engaging in field work for the company until November 1, 1903, at which time he severed all connections with the life insurance company.[261] Thereafter he engaged in the private practice of medicine. In 1906 he had an office at 302 Hulet Block (Seventh Street and Hennepin Avenue) in Minneapolis, and a residence at 2128 Dupont Avenue North. In 1907 he moved to Maple Plain, and at some time in the twenties he went to California. He died of pulmonary edema and acute cardiac dilatation at Monrovia, California, on November 11, 1926.[262] He was interred in the Monrovia Mausoleum.

Doctor Higgins was a member of the Masonic fraternity, and of the Minneapolis Commercial Club while he lived in that city. He had joined the Baptist church at Wasioja in 1869, and in Minneapolis he attended the Calvary Baptist Church. One of his close friends in Dodge County was Dr. Chauncey Almer Kelsey (1847-1918), who came from the same town in Goodhue County as that in which Doctor Higgins' wife had lived. Both men attended the Groveland Seminary at Wasioja, and Doctor Kelsey, as will be shown, married the daughter of the principal of the seminary, Dr. L. B. Allen.

Dr. Warren Burlingham Steere (1832-1900) was said[263] to have been born in Hartwick, Otsego County, New York, on December 9, 1832, although there is reason for suggesting that the year was 1842, as will be shown. He was the son of Elisha Steere and Fanny Burlingham Steere.[263] On his father's side Doctor Steere was related to the famous Roger Williams (1607-1684). The nature of Doctor Steere's early schooling is not known, but he was graduated from the old Eclectic Medical College of Philadelphia on January 22, 1862,[100] where it is thought that he studied dentistry as well as medicine. He then settled in DeWitt, Iowa, where he remained for about fifteen years. He came to Dodge Center in the spring of 1877, where he seems to have practiced dentistry rather than medicine. He was never licensed to practice medicine in Minnesota.[40] Doctor Steere stayed in Dodge Center until about 1881, in which year he removed to the Territory of Dakota, settling in what is now Pierre, South Dakota. For a while he practiced dentistry in and about Pierre; then he went to Chicago for additional medical training. On March 24, 1884, he

was graduated from the old Bennett College of Eclectic Medicine and Surgery,[264] and on April 28, 1886, he was licensed to practice medicine in the Territory of Dakota.[100] At that time he was living in Pierre. On November 23, 1886, Doctor Steere was licensed to practice medicine in Iowa, receiving Iowa Medical Certificate No. 928. At that time he reported that his place of residence was Des Moines, and he gave his age as forty-four years, which would indicate, as stated previously, that he had been born in 1842. It was said[263] that Doctor Steere specialized in obstetrics, and that he was proficient in this branch of medicine; but he was also, of course, a general practitioner. In about 1890 Doctor Steere was called to Des Moines to become a professor in the old Iowa Medical College, Eclectic,[263] but the town in South Dakota in which he was living at the time of his departure for Des Moines is not known. It may have been Goodwin, which was the home of his son. It was reported[265] that Doctor Steere died in the spring of 1900, from the effects of a fall complicated by pneumonia. Where he died it is not known, but the widow[263] of Doctor Steere's son believed that he died in Des Moines. The Division of Vital Statistics of the Iowa State Department of Health,[266] however, has no record of a certificate of death for Doctor Steere.

Dr. John Lewis Martin (1806-1885) was born in Albany, New York, on September 17, 1806, but nothing is known of his parents or his early education, although it has been said[267] that for a while he served as a clerk in a store. Neither is it known that he was a regularly graduated physician, but his granddaughter[267] reported that he had a certificate that had been issued to him by some institution or organization in New York State. This may well have been a license to practice medicine from a medical society, for in the early part of the Nineteenth Century in New York it was medical societies which possessed the power of licensure, as the secretary[88] of the New York State Board of Medical Examiners has reported. While Doctor Martin was still in Albany he was married to Miss Emeline J. Berghes,* who was a music teacher. Doctor Martin also was an ordained minister of the Wesleyan Methodist Church; when and where he was ordained it is not known. At some time not now ascertainable, Doctor Martin and his wife moved to Valparaiso, Indiana, and remained there for about five years. He then journeyed to what is now Grand Meadow, Minnesota, with his wife and children, making the long trip by ox-cart.[267] There he built a log house, in which he conducted the first neighborhood school of the surrounding country. It was said[267] that in about 1866 Doctor Martin was of great service to his community during the epidemic of diphtheria which raged in Southern Minnesota that year. At some time in the early seventies Doctor Martin moved with his family to Wasioja in Dodge County, so that his children could be educated at the old Groveland Seminary, which by this time had come into the hands of the Wesleyan Methodist Church. His granddaughter[267] said that he also lived and practiced medicine in Jackson, Minnesota; but she did not say when this was. Another granddaughter,[268] who as a girl lived with Doctor Martin and whose husband drove Doctor Martin's team for him, said that at one time he had lived in High Forest in Olmsted County.

Doctor Martin is known to have practiced homeopathic medicine in Wasioja, and it was recorded,[83] as previously said, that in 1878 he had assisted Doctor Flood of Mantorville and Doctor Garver and Doctor Ranson of Dodge Center at a necropsy. At various times in 1879 and 1880 Doctor Martin preached ser-

*Doctor Martin did not care for the name "Emeline," so his wife changed it to "Elizabeth." The name "Emeline J. Martin," however, was used on her tombstone.

mons in the Wesleyan Methodist Church at Wasioja.[68] He seems to have been in active practice to within a year of his death, as is indicated in the following paragraph from the Wasioja news notes in the *Dodge County Republican* of January 24, 1884:

> On Friday evening last [January 18, 1884], the family of J. L. Lang were made sick by eating a pie in which tartar emetic had been used, by mistake, instead of tartaric acid for flavoring. Doctors Martin and Flood assisted in restoring them to a normal condition.

Doctor Martin died in Wasioja, probably of cardiac disease, on September 22, 1885. According to the sexton[269] of the Wesleyan Methodist Church of Spring Valley, Dr. and Mrs. Martin were buried in the Frankford Township cemetery, a few miles from the villages of Spring Valley and Grand Meadow.

Dr. Chauncey Almer Kelsey (1847-1918) was born in Potsdam, Saint Lawrence County, New York, on December 27, 1847, the son of Wilson Kelsey and Jane Chittenden Kelsey.[246] As a boy Doctor Kelsey was brought to Cherry Grove Township in Goodhue County by his parents, probably in 1855.[270] The boy was educated in the local public schools and also at the Groveland Seminary at Wasioja in Dodge County. His son[71] described Doctor Kelsey as a poor farm boy who educated himself largely by his own ingenuity and labor: "He was always cheerful and optimistic, delighted in scheming great schemes some of which came out well and some of which didn't. He never got away from his love of farms and lands and horses." Doctor Kelsey was well known in the vicinity of Wasioja long before he became a physician, and before he settled in Concord in August of 1877,[69] to remain for a short period. He had entered the old Chicago Medical College (Northwestern University Medical School), from which he had been graduated in 1875, and in the same year he had been married to Miss Isabella Prince Allen, daughter of Dr. L. B. Allen, principal of the Groveland Seminary at Wasioja.[71] Where Doctor Kelsey practiced immediately after his graduation from medical college it is not known, but in August of 1877, as stated previously, he located in Concord. Later in the same month he visited Kasson with his good friend, Dr. Curran W. Higgins (1849-1926). By the year 1880 he was in Oakwood, in the Territory of Dakota,[271] but he was never licensed to practice medicine in that territory.[72,100] Later he was in Chicago, but there is no evidence that he was licensed to practice medicine in Illinois.[73] He was licensed to practice medicine in Minnesota in March of 1899, by affidavit,[210] and at the time he was living in Minneapolis. On June 23, 1899, he was elected to membership in the Minnesota State Medical Society, at the thirty-first annual session of that body in Minneapolis.[272]

At the thirty-fourth annual session of the Minnesota State Medical Society in 1902 Doctor Kelsey delivered a paper on "Plaster-of-Paris Casts,"[273] and in it he spoke of his "experience of twenty-seven years" in medicine and surgery. At this session, also, he introduced the following resolution,[274] which was tabled:

> Whereas, It is a well-known fact that the use of tobacco is injurious, especially when the habit is formed in youth, and
>
> Whereas, Every father desires that his boys shall escape the evil injuries of the habit; therefore be it
>
> Resolved, That we, the members composing the State Medical Society of Minnesota, object to being put on record as favoring the use of tobacco, and request that in the future the word "smoke" never be used in connection with our socials.

Probably no one at the meeting realized that almost a half century previously, when the old territorial Minnesota Medical Society met at Saint Paul on July 23, 1853, Dr. Alfred Elisha Ames (1814-1874) had introduced a somewhat similar resolution in which "the sale of intoxicating drugs and medicines" was condemned by the society.[170] This resolution had been adopted.[170]

Doctor Kelsey was always keenly interested in the proceedings and discussions at various sessions of the Minnesota State Medical Society, and he entered into the activities of the organization with energy and insight whenever he attended a meeting. He was willing to discuss almost any sort of paper read before the society, and his remarks as set down in various volumes of the *Transactions* indicate that he must have enjoyed the practice of medicine. In about April of 1906 he removed to Boyero, Colorado,[275] and he was licensed to practice medicine in that state on October 1, 1907, receiving License No. 5457.[246] Toward the latter part of his life, his son[71] said, Doctor Kelsey gradually relinquished his interest in medicine and turned to real estate. He died of carcinoma of the liver at the Seaside Memorial Hospital, Long Beach, California, on April 27, 1918.[262]

Dr. John Flood (1850-1918) was a curious man of seemingly unbounded energy and ingenuity. He was a Kerry man, born at Tarbert in Kerry County, Ireland, on June 24, 1850.[276] His mother died when he was an infant, and he was brought to the United States as a boy of twelve years by his father. Young Flood was reared in the city of Chicago, which in medicine of the era was famous for such men as Dr. Nathan S. Davis (1817-1904), founder of the American Medical Association,[277] Dr. Daniel Brainerd (1812-1866), founder of the Rush Medical College,[277] Dr. William Heath Byford (1817-1890), founder of the Woman's Hospital Medical College of Chicago,[277] and Dr. William B. Herrick (1813-1865), first president of the Illinois State Medical Society.[277] On January 26, 1873, at the age of twenty-three years, Doctor Flood was graduated from the old Bennett College of Eclectic Medicine and Surgery of Chicago, where he may have known Dr. Nereus M. Cook (1852-1927), who founded the eclectic *Minnesota Medical Mirror* at Cambridge, Minnesota, in 1881.[127] Doctor Cook was a member of the class of 1874.

Doctor Flood was married to Miss Matilda E. Johnson of Chicago in 1876,[276] and their daughter, Allie Elizabeth Flood (Mrs. A. W. Hannah of Chicago) was born there on May 30, 1878. Doctor Flood was licensed to practice medicine in Illinois on October 31, 1877.[73] Doctor Flood settled in Mantorville in Dodge County in July of 1878. "Dr. John Flood, of Chicago, has hung out his shingle at the Hubbell House,*" it was recorded in a Mantorville item of the *Dodge County Republican*,[278] "and proposes to settle here, if the situation proves favorable. We certainly need a *resident* physician." In August of 1878 Doctor Flood bought or leased the old school house* at Mantorville with the intention of turning it into a "Hygienic Institute," probably so that he could meet the offerings of Dr. D. B. Geil of Mantorville, who had opened a "Hygienic Institute" of his own in the town. In September of 1878 a large steam vat and steam engine for the institute were unloaded from railway cars, and a little later Doctor Flood's institute was opened to the public. It would seem that he was successful in causing Doctor Geil to leave Mantorville, for that physician was in Kasson after the first of the year, 1879. In January of 1882 Doctor Flood formed a partnership with Dr. J. Clark Bliss (1846-?) of Wisconsin.[99,279]

*These structures are still standing in Mantorville (1943).

The partnership did not last long.[111] In 1883 Doctor Bliss moved to Claremont. Doctor Flood bought a house in Mantorville,[280] and soon was busy in extracting bullets, setting fractured extremities, attending patients stricken with scarlet fever (often with Dr. Jasper Bedient of Mantorville), and occupying himself with his stable of race horses. In the summer of 1883, for instance, he sold his pacer, "Joe Johnson," for $600. He was licensed to practice medicine in Minnesota on September 12, 1885, receiving License No. 1099.[40] He was the preceptor of Dr. Guy Philander Corwin (1855-1929) of Wasioja, as will be shown, and he seems to have been well enough known in Chicago for the old *Chicago Medical Times* to publish this paragraph about him in 1886:

> Doctor Flood, of Minnesota, says that he has almost universally found tenderness on pressure over the fifth cervical vertebra in choreic cases. In these he applies the ether spray over the tender spot, and follows that with a mild counter-irritant. Then with a judicious use of tonics and ergot he has generally been successful in the treatment.

In 1888, ten years after he had come to Mantorville, Doctor Flood terminated what seems to have been a profitable practice to go to the Rush Medical College in Chicago. During his absence Dr. Samuel H. Van Cleve (1843-1912), who was city physician in Minneapolis at the time, came to Mantorville to maintain Doctor Flood's practice for him. When Doctor Flood returned to Mantorville in 1889, he sold his practice there to Doctor Van Cleve, and moved to Kasson. While he was at Kasson he was elected to membership in the Minnesota State Medical Society, on June 21, 1889.[282]

Doctor Flood was a stockholder in the old Minnesota College Hospital of Minneapolis,[276] founded in 1881 by Dr. Frederick A. Dunsmoor (1853-1930), Dr. Amos Wilson Abbott (1844-1927) and others. Those interested in the history of this pioneer medical college are referred to Dunsmoor's interesting report[92] of 1909 and to the announcement of the opening of the school in one of the first issues of the *Northwestern Lancet*.[91] In the spring of 1891 Doctor Flood sold his practice in Kasson to Dr. Charles O. Wright,[148] and left Dodge County to enter the publishing business in Omaha, Nebraska.[282] In May of 1891 he issued the first number of a publication called the *Illustrated World of Art*.[283] At some later time he returned to Chicago, where he died during the great epidemic of influenza of the first World War, on September 28, 1918, of pneumonia.[284]

Dr. Francis Alfred Comfort (1841-1915), as previously stated, was in Concord for a short time in the summer of 1878, at which time it was said that he was a physician "of some 12 years' experience."[82] He was born in Beamsville, Ontario, Canada, on November 22, 1841,[205] but the names of his parents are not known. Records of the Alumni Association of the University of Michigan indicate that Doctor Comfort was graduated from the University of Michigan Department of Medicine and Surgery in 1866,[205] but Doctor Comfort himself told the Division of Licensure and Registration of the Iowa Department of Health that he had been graduated from the aforementioned institution on March 30, 1865.[264]

Doctor Comfort was thirty-seven years old when he came to Concord, and in view of the very short period of his stay there, it seems obvious that he was trying out a location. He was never licensed to practice medicine in Minnesota, but on September 22, 1886, he was licensed to practice medicine in Iowa, receiving Certificate No. 557.[264] At the time he was living in Logan, Iowa. It seems probable that he practiced medicine in Nebraska, also, for he was licensed to

practice medicine in that state on March 4, 1897, receiving License No. 2147.[285] Doctor Comfort died of heart disease at Logan, Iowa, on January 21, 1915.[205,286]

Dr. Francis Reuben Woodard (1848-1926) was born in Madison, Lake County, Ohio, on July 15, 1848, the son of Joseph S. Woodard and Frelove M. Baker Woodard.[287] In December of 1858 his parents decided to emigrate to the new state of Minnesota. The father journeyed to Chicago to purchase a stock of drugs, and the mother and her children traveled as far as La Crosse, Wisconsin, by railway. From that town they reached Rochester by sleigh. The father, meanwhile, had acquired his supply of drugs in Chicago, purchased a horse and buggy there, and had driven the entire distance to Rochester, where he speedily opened the first pharmacy in the town. It was said that he sold the first quantity of kerosene to be used in Minnesota.[287] Young Woodard had attended public schools in Painesville, Ohio; in Rochester he completed his primary education while he was assisting his father in the prescription room of the pharmacy. In 1869 he entered the University of Michigan, where he spent two years in literary courses and one year in the study of law.[287] After an intervening period which was spent in Rochester he entered the University of Michigan in 1875, to study medicine for one year. In 1876 he matriculated at the Rush Medical College of Chicago, from which he was graduated in 1876. He settled very soon in Claremont in Dodge County, and was elected a member of the Minnesota State Medical Society on June 21, 1881, at the thirteenth annual session of the society.[288] Elected to membership with him at this session were such men as Dr. Charles S. Bigelow (1845-1931), who was to succeed Doctor Woodard at Claremont within the year; Dr. William Alexander Jones (1859-1931), for years editor of the *Northwestern Lancet* and the *Journal-Lancet;*[289] and Dr. Amos Wilson Abbott (1844-1927), notable Minneapolis surgeon who founded Abbott Hospital in Minneapolis in 1902,[290] helped to found the Minnesota Pathological Society,[291] conducted the first cystoscopic examination in Minneapolis, was the first in that city to utilize nitrous-oxide anesthesia,[92,290] and helped to found the old Minnesota College Hospital in Minneapolis in 1881.[92] Two members of the committee which examined Doctor Woodard's credentials were Dr. Jay Owens (1852-1890), who founded the *Northwestern Lancet* at Saint Paul in October of 1881;[289] and Dr. William W. Mayo (1819-1911) of Rochester, father of Dr. William J. Mayo (1861-1939) and Dr. Charles H. Mayo (1865-1939).

Doctor Woodard was licensed to practice medicine in Minnesota on October 11, 1883, under Certificate No. 115.[40]

In 1881 Doctor Woodard decided to move to Minneapolis. His practice at Claremont was taken over by Dr. Charles Sumner Bigelow (1845-1931), whom he had known during student days at the University of Michigan. In Minneapolis Doctor Woodard became a successful and respected practitioner. He served for ten years as a commissioner of the Minneapolis Board of Charities, and for six years as president of this board. He was attending physician to the Asbury Hospital and consulting physician to Saint Mary's Hospital and the Lutheran Deaconess Hospital, as well as gynecologist to the Minneapolis City Hospital.[287] He was a member of the American Medical Association, Minnesota State Medical Association, Hennepin County Medical Society and the Minnesota Academy of Medicine. For many years he maintained his residence at 2104 Park Avenue in Minneapolis, and in social activities devoted his interests to such groups as the Minneapolis Athletic Club and the Masonic order. He was a member of the Park Avenue Congregational Church.

Doctor Woodard died at Saint Augustine, Florida, on March 29, 1926, at the age of seventy-eight years.[292] He had spent forty-seven years in the practice of his profession, forty-five of which had been spent in Minneapolis.

"Dr. Woodard carried on an active practice as a general practitioner and surgeon from 1881 to the time of his death," it was written. "He was associated at one time with Dr. J. Warren Little and later with Dr. William H. Newhall."[292]

Dr. Frank H. Garver (1857-1881) was born in Wasioja on January 20, 1857, the son of Dr. James A. Garver and Eliza Miller Garver. He was tutored largely by his parents in Wasioja, and this elementary education was augmented by his attendance of the old seminary at Wasioja. It was said that at an early age he became intensely interested in chemistry and physiology, an interest which his father no doubt encouraged. He next attended the University of Minnesota for one year, after which he transferred to the Medical Department of Butler University of Indianapolis, from which he was graduated as a physician on February 25, 1880. He then returned to Dodge County to practice medicine for a few weeks with his father in Dodge Center, but on March 19, 1880, he settled in Goodwin, Territory of Dakota. At some time in the latter part of February, 1881, he fell a victim to fever of an indeterminate origin, and he died at Goodwin on March 11, 1881, not even a year after he had located there. He was buried in the Garver lot in the little pine-covered cemetery on the steep bluff above the Zumbro River at Wasioja, within sight of the old Wesleyan seminary wherein he had first been inculcated with the desire to become a physician. Today only the crumbling yellow stone walls of this frontier educational institution are standing.

Dr. Charles Sumner Bigelow (1845-1931) was of a family distinguished in the service of the United States. He was first cousin to the prominent Abolitionist, United States Senator Charles Sumner (1811-1874) of Massachusetts, and his father, Dr. Thomas Sumner Bigelow, was a Vermonter, a graduate of the Jefferson Medical College of Philadelphia, and a jeweler and inventor of considerable acumen. He invented such useful devices as the Foster clasp tug buckle, the "Little Giant" cane-crusher, a tin double-seamer and others which are in common use today. Doctor Bigelow's mother, Clarissa Jacobs-Warner of Elmira, New York, was the daughter of a physician.

Dr. Charles Sumner Bigelow was born at Middlebury (now the fourth ward of Akron), Ohio, on December 15, 1845. He attended the public schools at Lake Mills, Wisconsin, and at the age of eighteen years, on June 29, 1864, he enlisted as a private soldier in Company F of the Third Wisconsin Infantry Regiment of Volunteers. He marched with General Sherman to the sea in 1864, and was discharged on January 9, 1865, because of disability sustained in service.

Returning to Wisconsin, the young man attended and was graduated from Milton College. For a while he taught school in Illinois, but in 1870 he began the study of medicine under the preceptorship of his brother, Dr. Edward Elisha Bigelow (1841-1926), then of Milan, Michigan, but later of Owatonna, Minnesota.

In 1873 Doctor Bigelow was graduated as a physician from the University of Michigan, and he established himself in practice in Illinois, where he remained until 1880. After a year of postgraduate instruction at Rush Medical College in Chicago, he came to Claremont in Dodge County in 1881. He was elected to membership in the Minnesota State Medical Society on June 21, 1881,[288] in company with Dr. Francis R. Woodard (1848-1926), who was about to leave

Claremont to settle in Minneapolis. In May of 1883 Doctor Bigelow was elected district clerk of Claremont,[293] and on December 31, 1883, he was licensed to practice medicine in Minnesota.[40]

Doctor Bigelow made several trips to the Territory of Dakota,[119,294,295,296] but the hardships of rural medical practice in the severe winters of the eighties in Minnesota induced him to move to Kansas in 1884.[297] There he settled in Ames. "His departure is a loss to the community," the *Kasson Vindicator*[298] remarked, in a Claremont item.

In Kansas Doctor Bigelow practiced his profession for about six years. He worked amidst fearful difficulties, however, for during the latter part of the eighties, as is well known, Kansas was visited by searing droughts. Doctor Bigelow therefore left Kansas to return to Minnesota in 1890, and this time he settled in Dodge Center[147] at the request of Dr. James A. Garver. Doctor Garver retired and turned over his practice to Doctor Bigelow, who remained in active practice in Dodge Center until his own retirement in 1912.

"Dr. C. S. Bigelow, who has recently located here, has rented and moved into the house formerly owned by the railroad company near the depot," it was observed[147] in October of 1890. "He will be pleased to receive calls from all who desire his services."

This tenure was interrupted in April of 1898, when Doctor Bigelow removed to Claremont, his original location, where he built an office building and re-established a practice. He brought Dr. William Henry Tefft (1873-1938), who had just been graduated from the University of Michigan, to maintain his practice at Dodge Center while he (Doctor Bigelow) was at Claremont. The Claremont venture proved to be unsatisfactory, and in the spring of 1899 Doctor Bigelow returned to Dodge Center and Doctor Tefft took over Doctor Bigelow's practice at Claremont. Doctor Tefft left Claremont on December 20, 1899, to go back to his old home at Belmont, New York.

In 1912 Doctor Bigelow moved to Madison Lake, Minnesota, where he practiced actively until a new physician could be obtained. His son, Dr. Charles Edward Bigelow (1879-), had in the meantime taken over his father's practice in Dodge Center, where he now is (1943).

The senior Bigelow was health officer of Dodge Center, president of the board of education of that town, and a member of such organizations as the Dodge County Medical Society, which he helped to reorganize in 1905, the Minnesota State Medical Society, and the American Medical Association. He was also a member of the Masons, Knights of Pythias and the Grand Army of the Republic. He was known as a quiet man, short of stature, who had a perfectly impassive face which never betrayed his emotions, even in the most intense situations. He was a competent, well-informed and tireless physician and surgeon.

Doctor Bigelow moved to Two Harbors, Minnesota, after he left Madison Lake, and removed to California in 1926, where he lived in Lynwood. He died there on April 13, 1931, at the age of eighty-five years, twenty-eight of which had been spent in professional services to the people of Dodge County.[299]

(To be continued in January issue)

References will appear at the conclusion of this article.

President's Letter

VALEDICTORY

No great satisfaction is to be derived from retrospects. The lessons drawn from history and experience are soon forgotten. Twenty-five years after the termination of the "War to End All Wars," we find ourselves involved in the most destructive war in all recorded history, and we must confess that that great effort resulted in a colossal failure, and the opportunities that it presented were lost. On a small scale, individual experience is similar and most of us must admit that, in comparison with our capabilities and opportunities, our accomplishments are far from satisfying. However, one can take some comfort in the thought that all development comes through a great number of small increments, and no one is a complete failure who has been able to make some small contribution to some good cause.

These considerations will lead the members of our Association to the correct conclusion that, in this valedictory letter, the President lays claim to but very little of the credit for the things that the Association has accomplished during the past year. He speaks simply as a member of the Association who has had the privilege of a particularly intimate contact with its inner workings.

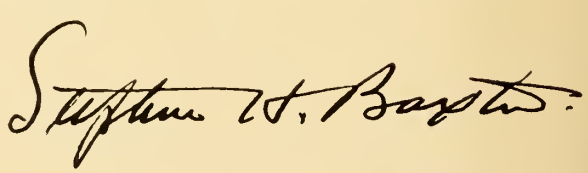
The Association is under especial obligation to those of its membership and employed staff who represented it at the State Capitol during the session of the Legislature. Without prejudice to other men who gave freely of their time and effort, I would like to single out for special mention Dr. Sogge, Mr. Rosell and Mr. Brist. They are men of whom the Association may well be proud. The results that they accomplished were a tribute to the respect in which they are held by the members of the Legislature. Largely due to their influence and efforts, some principles were reaffirmed and strengthened which are essential to a free, unregimented medical profession.

Members of our Association took a leading part in the establishment of the new Council on Medical Service and Public Relations of the American Medical Association, and one of our members, Dr. Adson, is a member of this Council. The expressed purposes and aims of this Council should convince any fair-minded person that the medical profession is fully alive to its responsibilities as guardian of the health of the American people, that it is progressive, recognizes its obligation to Society and that it is actively seeking the means for improving medical service to all the people in ways that are in harmony with the American principles of free enterprise and encouragement to individual initiative.

The future holds no more important task for our Association, it seems to me, than that of making Minnesota, to the utmost degree possible, medically self-sufficient, not only in remedial medicine and surgery, but in preventive medicine. It ought to be impossible for anybody to sustain the charge that there are people in Minnesota who need and want modern medical care but are unable to obtain it. It is within the power of Minnesota agencies and the medical profession of Minnesota to provide such service. There should be but little need or excuse for the intrusion of any Federal Agency, Administration, Bureau or Service into Minnesota to provide medical care, or even preventive or public health measures, for its people. With the people of Minnesota so provided, our Congressmen and Senators would be armed with the strongest possible arguments against any present or future Wagner-Murray schemes.

I wish to conclude this last letter to the Association with an acknowledgment, to all its members, of the great honor and privilege which I have enjoyed this year as their President. In return for that honor I hope that I have been able to contribute something to the advancement of the Association. I wish to thank the official family of the Association, the Council, and the Chairmen and Members of Committees for many acts of kindness and courtesy—yes, and charity, too. A word of thanks is small compensation for the debt that I owe the Executive Secretary and his staff for help on many occasions, but I hope that they will accept it as a sincere expression of deep obligation.

To my successor I yield this President's Page with keen anticipation of his inaugural message which will appear here next month, and with my best wishes for a profitable and successful year for himself and the Association.



President, Minnesota State Medical Association

Editorial

Carl B. Drake, M.D., *Editor;* George Earl, M.D., Henry L. Ulrich, M.D., *Associate Editors*

PENICILLIN

THERE is no doubt but that the year 1929 aside from being remembered as the beginning of the greatest financial depression in history will be outstanding in medical history. In that year the English investigator, Fleming, noted that a mold contamination of a culture of staphylococcus had caused the death of contacted colonies. Though many types of mold exist, this original one isolated by Fleming is the one used in the preparation of the drug given the name of penicillin.

Apparently non-toxic, this material obtained from the culture medium used in growing the mold is proving itself marvelous in overcoming a variety of infections. It is effective clinically in infections due to the streptococcus hemolyticus, staphylococcus, pneumococcus, gonococcus, and treponema pallidum, and doubtless other organisms not so far determined. Unfortunately penicillin has not proven efficacious in the treatment of endocarditis due to the streptococcus viridans.

The output of pharmaceutical houses in ever-increasing amounts has so far been made available only to the armed forces and a few institutions for further clinical investigation. It is hoped that it will be obtainable for civilian use before many more months.

Recent medical literature has contained numerous articles on the subject. Before the Medical Forum in St. Paul last month Dr. W. E. Herrell of the Mayo Clinic gave a most impressive presentation of experience so far with this new drug. Patients from infancy to old age with severe staphylococcus blood stream infection and doomed according to all past medical experience showed sterile blood cultures after twenty-four hours of continuous administration of penicillin. Infections which failed to respond to sulfa drugs have yielded to penicillin. A case was reported of a sailor incapacitated for ten months from gonorrhea whose infection was refractive to the sulfa drugs responding promptly to this new drug.

The recently reported work of Mahoney opens an entirely new field for penicillin therapy. It appears from his work that penicillin is an exceedingly effective agent against both experimental and clinical syphilis. Further work must be done to determine whether or not penicillin is actually spirocheticidal. In the treatment of primary syphilis, dark field examinations were reported negative after seven hours of treatment. If confirmed, this is a far-reaching contribution.

Penicillin has been found to be sensitive to heat and cold, and is destroyed in a too acid or too alkaline medium. While the drug in large amounts is non-toxic, 40,000 units given by continuous intravenous injections over a twenty-four hour period has been found to be efficient in the most severe blood stream infections. There is no doubt but what the continuous intravenous administration of penicillin is the most effective means of maintaining a constant level of the antibacterial agent in the blood stream. The intermittent intramuscular administration probably requires larger amounts of penicillin than are necessary for the intravenous drip method. Further, if a three-hour interval occurs between injections, there will occur a period of at least one to one and one-half hours during which time little, if any, penicillin is present in the patient's blood. This is due to the rapid disappearance of penicillin from the blood and to its rapid excretion in the urine. Approximately 50 to 60 per cent of the penicillin administered may be recovered from the urine of patients. Because of its excretion in the urine, it should prove of great value in the treatment of urinary infections due to susceptible organisms.

The antagonisms existing between microörganisms has long been known. It would seem the only reason why this world has not been overrun by bacteria is this existing antagonism, and that many bacterial forms present in good mother earth constitute a valuable function in destroying infected matter buried in the ground.

Valuable as the sulfa drugs have proven, their undeniable toxicity constitutes some drawback to their use. The demonstration of the effective action of penicillin in infections which fail to respond to sulfa drugs and its lack of toxicity, in-

dicate that it will prove even a greater boon to mankind than sulfa drugs, invaluable though they have proven to be.

NEUBURGER—THE MEDICAL HISTORIAN

DECEMBER eighth marks the seventy-fifth birthday of the dean of medico-historians, Max Neuburger, whose works and researches are well known to everyone interested in the history of medical science.

Born and raised in Vienna, he attended the University there, receiving degrees of M.D., and Ph.D. in history. Although he specialized in neurology and psychiatry, his interest in the history of medicine soon reached such heights that he gave up private practice and habilitated as *privatdozent* in the history of medicine at the University of Vienna in 1898. Six years later he became "extraordinary" and in 1917 "ordinary" professor.

His original and profound historical researches, the creation and development of the Institute of Medical History at the University of Vienna, and his accomplishments as a teacher of the History of Medicine soon gained Professor Neuburger fame as a medico-historian. His works cannot be herein listed in detail. This is being done in journals devoted to the history of medicine. Although Neuburger's historical researches touched practically every phase of this enormous field, they were concerned mainly with the history of neurology and neuropsychiatry and of the Vienna School. His first substantial publication, *The Historical Development of the Experimental Brain and Spinal Cord Physiology before Flourens* (1897), is a work that could be produced only by a man trained as a neurologist and a historian. He published many other works elucidating the history of neurophysiology, neuropathology, and psychology. His writings on the early psychologist Ernst von Feuchtersleben earned the praise of the greatest medico-historians. Neuburger became internationally known through his important studies of the neurophysiology of Swendenborg, whom "he brought closer to most scientists than anybody before him"—as a Viennese historian expressed it.

The second phase of medical history that fascinated him was the history of the Vienna medical school from its earliest development to the present. Numerous are his books and articles dealing with the various "Vienna schools," and with their notable leaders, including van Swieten, de Haen, Stoll, Johann Peter Frank, Rokitanski, Skoda, Semmelweis, Türk, and many others. Neuburger is undoubtedly the greatest authority on this large and important chapter of the history of medicine. In this group belongs Neuburger's edition of Auenbrugger's *Inventum Novum* (1929), which includes a facsimile of the first edition published in 1761; the most important French, English and German translations of this work; and an excellent introduction.

His opus magnum is his *History of Medicine* in two volumes (1906-1910), which was translated into English and published by the Oxford Press (1910-1925) with an introduction by no less important a medical leader than Sir Wm. Osler, who described the book as "particularly useful to the English and American student—clearly written, not too exhaustive, and well and systematically arranged." It was acclaimed in every corner of the world. This, as well as other works, prompted Fielding H. Garrison to call Neuburger "easily the greatest philosophical historian of medicine."

His editing (with Pagel) of the *Handbuch zur Geschichte der Medizin* (1902-1905), the most complete and exhaustive encyclopedic work on the history of medicine, was a very important contribution. Other works that serve to illustrate the wide variety of his researches include: *The History of Antitoxic Therapy* (1901), *Medicine in Flavius Josephus* (1919), *The Healing Power of Nature* (1926), and *Theories on the Mechanism of Specific Nutrition* (1900).

Aside from being a great historian, Neuburger was an excellent teacher; he attracted pupils from every country in the world. His lectures were extremely interesting and his enthusiasm most contagious.

Neuburger created the Institute of the History of Medicine at the University of Vienna. It was located in the Josephinum, the building of the defunct Josephinian Military Medical Academy. He started it by contributing his own medico-historical library and collection. A thorough examination of this treasure house of medical history was one of the most satisfying experiences open to the student of medical history as well as to the physician.

Neuburger reaped many honors, and there is hardly a country in which he was not an honorary or corresponding member of learned so-

cieties. As late as 1935 he attended the International Congress of Medical History in Madrid as delegate of the University of Vienna and its medical faculty, and on this occasion he received an honorary degree at the University Alcala. His life, however, was not lacking in sorrows and difficulties, but thanks to his enthusiasm, he was able to weather periods of economic and emotional depression.

In recent years the political upheavals in central Europe made it impossible for him to remain with his once beloved university, and he accepted the hospitality of England, where he was elected an honorary member of the Royal Society of Medicine in 1939. For several years he has been connected with the Wellcome Historical Medical Museum. In spite of illness and a serious operation, his spirit, enthusiasm, and working capacity remained at the highest level, as is proved by his recently published *British Medicine and the Vienna School, Contacts and Parallels* (1943). This volume illustrates once more Neuburger's sincerity and his scientific honesty qualities, which gained recognition a quarter of a century ago in the motto on the *Festschrift* to his fiftieth birthday—*Vir integer scelerisque purus.* On this his seventy-fifth anniversary, Neuburger's pupils and friends all over the world congratulate him.

Ad multos annos!

ROBERT ROSENTHAL, M.D.

EDITOR'S NOTE: Appearing in this issue is a translation by Alfred Rosenthal, of an article entitled, "The Discovery of the Pulmonary Circulation of the Blood," by Max Neuburger.

ERTRON

AS a result of the appearance in the November *Reader's Digest* of an article by Paul de Kruif on the use of ertron in arthritis, physicians will be asked about the value of the preparation by patients suffering from various forms of this affliction.

From the tone of the article the uninformed individual might be led to believe that here is the long-sought solution of the arthritis problem. While it is true that the claim of 100 per cent cure, is not made, the impression is given that here is a remedy overlooked by the profession in general, and it has been left to de Kruif to tell the world.

The makers of ertron claim that it is irradiated ergosterol specially prepared by a new electric process. It is put out in capsules each containing 50,000 U.S.P. units of Vitamin D. It was on the market as far back as 1935, and has been offered to the profession with most extravagant claims. Of late the literature sent the profession has been more insistent, and has been accompanied by reprints in proof of its value.

The use of Vitamin D in the treatment of arthritis is not new. Many physicians have used it and have used this special preparation known as ertron with indifferent results. As far back as 1937 the Council on Pharmacy and Chemistry investigated the preparation, although the manufacturers had not submitted it to the Council.

In their refusal in 1937 to accept ertron for inclusion in New and Non-Official Remedies, the Council called attention to the danger of relying too much on improvement in subjective symptoms as reported by patients in estimating the value of a remedy used in a disease subject to remissions. At that time the critical examination of the reports of the value of Vitamin D in this treatment of chronic arthritis revealed little to warrant the belief that the beneficial effects claimed were specific and the Council deprecated the unwarranted exploitation of ertron to the profession. There is room for considerable doubt whether more recent experience with the drug warrants any change in its status.

MEDICAL CURRICULA

THE entire program of medical education has now been set up for a nine months' instead of a twelve months' period of training, beginning with the premedical course and ending with hospital residenceship. During the transition, confusion has taken place, in many instances, some hospitals having doubled their usual number of interns for a period of three months.

Medical students in the Reserve after completion of a nine months' internship will receive an additional three months' training before entering active service, six weeks of that time to be spent in a military hospital and the other six weeks in military training in a camp.

To provide for the need of hospitals for residents, it has been agreed that one-third of the graduating interns will be retained by the hospitals as residents for a second period of nine months, and half of the residents will be allowed to take a second nine months' period of hospital training as residents.

Although this rearrangement and shortening of the medical course is a war measure, it is possible that it may result in a permanent shortening of the medical course. It has been felt for some time that three and in some instances four months of summer vacation have been unnecessarily long. On the other hand, the intensity of the eight or nine months' study necessitates some vacation. Further, the long vacations enabled many students to earn their way through medical school. Doubtless some modification in the previous curricula could and will be made to advantage.

HOSPITAL INSURANCE

THE editorial entitled "The AHA and the AMA," which appeared in the October number of MINNESOTA MEDICINE, dealt with the controversy between the two organizations over the inclusion of medical service in some hospital service contracts. No stand was taken in the editorial, but an attempt was made to present both sides of the question. It was stated in the editorial that we would welcome a proposal which would help solve the problem.

In response to the editorial, we received three letters which are being reproduced under the heading, "Communications," in this issue, in the hope that the further light they throw upon the subject will be of value.

Most incorporated private hospitals employ the services of radiologists and pathologists, about half of the radiologists being compensated on a percentage basis, the other half on a salary or a salary plus percentage basis. The relation of these medical men to the hospital has been the subject of legal consideration on more than one occasion. Without going into the legal aspects of the subject to any great extent, it seems to be the general consensus of legal opinion that a radiologist so employed is an agent of the hospital, and the hospital, therefore, is a corporation in the practice of medicine. There is reason to believe, however, that the laws relating to the practice of medicine by corporations do not apply and were never intended to apply to hospitals. Otherwise, all such hospitals would be guilty of breaking the law. If the present method of compensation of medical men (and this is a legal question which we shall not attempt to settle) constitutes a violation of law, it should be possible to change the method of compensating them for their services, so that they would be acting as independent practitioners and not as agents of the hospital.

It is not only highly desirable but essential that hospitals shall not dispense the services of medical men. There is no argument as to whether radiologists and pathologists are medical men or not. They are.

Hospital service organizations provide insurance against hospital expense, and it is natural that some of these organizations, in order to make their contracts more attractive, should have included some x-ray and other laboratory service. Most have not done so. Those who have studied the subject are convinced that if the services of radiologists and pathologists are included in these contracts, there is no logical reason why the scope of such contracts could not be extended to include the services of other medical specialists. That is why the AMA House of Delegates took such a firm stand in opposing the inclusion of medical service, even of a limited sort, in Blue Cross contracts.

The suggestion made by Dr. Garland in his letter, which is among those being published, that a joint "medical-hospital" policy might be written which would furnish funds to defray the cost of diagnostic medical services and/or medical and surgical fees deserves consideration. After all, everyone is interested in devising ways and means of meeting the cost of catastrophic illness which generally requires hospitalization, the hospital expense being, however, only a part of the total.

AMERICAN MEDICAL ASSOCIATION

Council on Medical Service and Public Relations

A STATEMENT OF GENERAL POLICIES

Pursuant to carrying out the duties imposed on it by the House of Delegates, the Council has adopted the following general policies:

1. The Council on Medical Service and Public Relations recognizes the desirability of widespread distribution of the benefits of medical science; it encourages evolution in the methods of administering medical care, subject to the basic principles necessary to the maintenance of scientific standards and the quality of the service rendered.

It is not in the public interest that the removal of economic barriers to medical science should be utilized as a subterfuge to overturn the whole order of medical practice. Removal of economic barriers should be an object in itself.

It is in the public interest that the standards of medical education be constantly raised, that medical

research be constantly increased and that graduate and postgraduate medical education be energetically developed. Curative medicine, preventive medicine, public health medicine, research medicine, and medical education, all are indispensable factors in promoting the health, comfort and happiness of the nation.

2. The Council through its executive committee and secretary shall analyze proposed legislation affecting medical service. Its officers are instructed to provide advice to the various state medical organizations as well as to legislative committees concerning the effects of the proposed legislation. It shall likewise be the duty of its officers to offer constructive suggestions to bureaus and legislative committees on the subject of medical service.

3. The Council approves the principle of voluntary hospital insurance programs but disapproves the inclusion of medical services in those contracts for the reasons adopted by the House of Delegates at the 1943 meeting.

4. The Council approves voluntary prepayment medical service under the control of state and county medical societies in accordance with the principles adopted by the House of Delegates in 1938. The medical profession has always been very much opposed to compulsory health insurance because (1) it does not reach the unemployed class; (2) it results in a bureaucratic control of medicine, and interposes a third party between the physician and the patient; (3) it results in mass medicine which is neither art nor science; (4) it is inordinately expensive; and (5) regulations, red tape and interference render good medical care impossible. Propaganda to the contrary notwithstanding, organized medicine in general, and the American Medical Association in particular, have never opposed group medicine, prepayment or nonprepayment, as such. The American Medical Association and the medical profession as a whole have opposed any scheme which on the face of it renders good medical care impossible. That group medicine has not been opposed as such is evidenced by the fact that there are many groups operating in the United States which have the approval of the medical profession, and members of these groups are and have been officials in the national and state medical organizations. That group medicine is the Utopia for the whole population, however, is not probable. It may be and possibly is the answer for certain communities and certain industrial groups if the medical groups are so organized and operated as to deliver good medical care.

5. The Council believes that many emergency measures now in force should cease following the end of hostilities.

6. The Council believes that the medical profession should attempt to establish the most cordial relationships possible with allied professions.

7. There is no official affiliation between the American Medical Association and the National Physicians Committee. However, since it is the purpose of the National Physicians Committee to enlighten the public concerning contributions which American medicine has made and is making in behalf of the individual and the nation as a whole, it is the opinion of the Council that the medical profession may well support the activities of the National Physicians Committee and other organizations of like aims.

8. American medicine and this Council owe a responsibility to our colleagues who are making personal sacrifices to answer the call of the armed forces. Therefore, the Council expresses the desire to coöperate with the medical committee on postwar planning in order to assist our colleagues in reëstablishing themselves in the practice of medicine, and in the preservation of the American system of medicine.

MINNESOTA EVALUATION SEROLOGY STUDY

H. E. MICHELSON, M.D.
Chairman, State Serologic Committee
Minneapolis, Minnesota

A report of the interlaboratory evaluation study of serologic tests for syphilis, performed in the laboratories in Minnesota during 1941 and 1942 has been sent to the participating laboratories and the State Serological Committee.† The study was made in accordance with the recommendations of the State Serologic Committee with the assistance of the Minnesota Department of Health.

During 1941 there were thirty-six laboratories making serologic tests for syphilis, of which thirty-one elected to take part in this study. In 1942 there were forty-nine laboratories making the tests, of which forty-five tested blood specimens available in the interlaboratory series.

It is desired to express sincere appreciation to the pathologists and laboratory technicians in Minnesota for their coöperation in these studies, both in arranging for the testing of the blood specimens and the prompt return of the results obtained to the Minnesota Department of Health. Most of the laboratories have expressed a desire to continue the interlaboratory testing of blood specimens because they have found it a satisfactory check on reagents and technique. Certain laboratories have found the procedure helpful in selecting a technique which would give satisfactory results in their hands.

The facilities of the Minnesota Department of Health are available to those local laboratories desiring assistance with laboratory procedures. The interlaboratory evaluation study is being continued and the opportunity for comparing test performance throughout the year is available to all laboratories in this state.

We wish to thank Miss Jennie Schey of the Department of Dermatology, University of Minnesota Hospitals for her coöperation and assistance with the donors.

(Turn page for list of laboratories)

Members of the State Serologic Committee include, N. H. Lufkin, M.D., Francis W. Lynch, M.D., Paul A. O'Leary, M.D., Arthur H. Sanford, M.D., Lucy Heathman, Ph.D., M.D., (ex officio), R. R. Sullivan, M.D., (ex officio). Assisting the committee in this study was Margaret W. Higginbotham, D.Sc., Evaluation Serologist, Minnesota Department of Health, Division of Preventable Diseases.

†A copy of the report will be sent on request.

1941 LABORATORY	1942 LABORATORY	CITY	TYPE OF TESTS
Abbott Hospital	Abbott Hospital	Minneapolis	1
Ancker Hospital	Ancker Hospital	St. Paul	2
Bethesda Hospital	Bethesda Hospital	Crookston	1
———	Bratrud Clinic	Thief River Falls	1
———	Dr. J. C. Davis	Minneapolis	1
Deaconess Hospital	Deaconess Hospital	Minneapolis	2
Eitel Hospital	Eitel Hospital	Minneapolis	1
Fairview Hospital	Fairview Hospital	Minneapolis	1
———	Dr. E. L. Gardner	Minneapolis	1
Gillette Hospital	———	St. Paul	1
———	Glen Lake Sanatorium	Oak Terrace	1
———	Glenwood County Hospital	Glenwood	1
———	Immanuel Hospital	Mankato	2
———	Loretto Hospital	New Ulm	2
Mayo Clinic	Mayo Clinic	Rochester	4
———	Miller Memorial Hospital	Duluth	1
Miller Hospital	Miller Hospital	St. Paul	2
Minneapolis General Hosp.	Minneapolis General Hosp.	Minneapolis	2
Minneapolis Health Dept.	Minneapolis Health Dept.	Minneapolis	2
Minnesota Dept. of Health	Minnesota Dept. of Health	Minneapolis	7
Montevideo Hospital	Montevideo Hospital	Montevideo	1
Mounds Park Hospital	———	St. Paul	1
———	Naeve Hospital	Albert Lea	1
———	Nicollet Clinic	Minneapolis	2
———	Northwestern Hospital	Minneapolis	2
Redwood Falls Hospital	Redwood Falls Hospital	Redwood Falls	1
———	Rice Memorial Hospital	Willmar	1
———	Dr. Robert I. Rizer	Minneapolis	1
St. Barnabas Hospital	St. Barnabas Hospital	Minneapolis	1
St. Cloud Hospital	St Cloud Hospital	St. Cloud	3
St. Francis Hospital	St Francis Hospital	Breckenridge	2
———	St. Gabriel's Hospital	Little Falls	1
St. John's Hospital	St. John's Hospital	St. Paul	1
St. Joseph's Hospital	St. Joseph's Hospital	Brainerd	1
St. Joseph's Hospital	St. Joseph's Hospital	Mankato	1
St. Luke's Hospital	St. Luke's Hospital	Duluth	1
———	St. Luke's Hospital	Fergus Falls	1
St. Mary's Hospital	St. Mary's Hospital	Detroit Lakes	1
St. Mary's Hospital	St. Mary's Hospital	Duluth	2
St. Mary's Hospital	St. Mary's Hospital	Minneapolis	1
St. Paul Health Dept.	St. Paul Health Dept.	St. Paul	2
St. Vincent's Hospital	St. Vincent's Hospital	Crookston	1
Swedish Hospital	Swedish Hospital	Minneapolis	4
Univ. Bacteriology Dept.	Univ. Bacteriology Dept.	Minneapolis	2
University Hospital	University Hospital	Minneapolis	2
———	Virginia Municipal Hospital	Virginia	1
Wesley Hospital	———	Wadena	1
———	Winona General Hospital	Winona	1

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

CHALLENGE TO MEDICINE

Is medicine to go forward or backward in America after the war?

Senator Wagner and his associates believe it will go forward only if the government and the Surgeon General of the Public Health Service are permitted to take over distribution and standards of medical service.

Henry Kaiser, the shipbuilder, believes it will go forward only if medical centers, financed by voluntary community pre-payment plans, with industry to spark them, are extended all over the United States.

Most physicians see the problem from the point of view of standards and scientific progress, chiefly, rather than of distribution. They believe medicine will go forward only if it remains essentially free from the shadow of political interference, regardless of whether it is paid for before the service is given, or afterwards, or not at all. On the other hand, they also believe in careful experiments with new forms of distributing the cost, to be used where they may be needed. But they believe at the same time, that the established form of private practice will be satisfactory, with minor modifications, for the vast majority, at least until some of the experiments with other forms now going on have definitely demonstrated their superiority. They believe, in any case, that medical service must be under the complete control of physicians and that local authorities, rather than the federal government, should be responsible, in coöperation with private agencies, for handling local medical problems.

Mr. Kaiser Agrees

It is interesting to note in Paul de Kruif's much discussed, newly published book called "Kaiser Wakes Up The Doctors," that Mr. Kaiser, himself, is in entire agreement with many of these beliefs of the doctors.

For instance, Mr. Kaiser lines up squarely against government hand-outs and control of medicine from Washington.

"You can't centralize 135,000,000 people," he remarks in the de Kruif book. "You haven't got the force for remote control."

He is certain, he says, that you cannot run medical care efficiently from Washington. Whether, as an alternative, you must have the hundreds of new health centers which Kaiser demands, is certainly doubtful, at least, and would be questioned by physicians and hospitals. On the other hand, these same physicians and hospitals would agree that new facilities and altered patterns may be needed in some quarters and that whatever form the new facility took, whether an industrial pre-payment plan or a medical center, the medical services should be controlled exclusively by medical men. They also believe that the new undertaking should not overlap or compete with any adequate, already-existing facilities.

May Be Useful Elsewhere

In point of fact, the doctors have usually seen the necessity for special facilities to meet unusual needs. The plan developed for the Kaiser shipbuilders in California is doubtless needed there and may be very useful elsewhere in similar industrial communities even after the war. Likewise, the coöperation between the California Physicians' Service with the Kaiser facilities for the care of wives and children of workers may have developed a useful pattern for future use in like abnormal circumstances.

Far from flying in the face of medical orthodoxy, as de Kruif seems to think, Kaiser has only put into vigorous practice in a crisis, principles which are recognized by all enlightened medical organizations, including the California State Medical Association. It is not surprising

that he should dream, in his enthusiasm for the success of his own project, of a blanket of industrial-medical enterprises covering the entire country, self-supporting and all-embracing. Sober reflection will undoubtedly show him that such dreams may not be capable of realization nor even desirable except in a small number of exceptional communities.

No Comprehensive Policy

There is a challenge to medicine, nevertheless, in the de Kruif book and in much other journalism about costs and distribution of medical care which is now receiving ready publication at the hands of news-conscious editors. It does not, of course, lie in mere acceptance or rejection of Kaiser's aspirations. But it does lie in the fact that organized medicine has not yet drawn up a comprehensive public policy, laying out a constructive program, for the health of the American people. The government, through Senator Wagner, has presented a plan, faulty and unsound though it may be. The doctors do not and cannot accept that plan. But they should draw up a policy of their own. They should not consider insurance plans only. What is needed now is something far more comprehensive. From the doctors should come an over-all study which soberly and realistically assesses the whole system in America today, picks out the weak spots, offers practical solutions for them and sets a course to aim at in future years.

It cannot be denied that organized medicine has failed to meet that challenge on a nation-wide scale, for the reason, perhaps, that such planning was considered to be the function of the individual states in accordance with their separate, individual problems. Some states have, in fact, accepted that responsibility. But a constructive social policy on a national scale has been lacking. An apparent disposition on the part of some doctors to block all medical-social reforms suggested by others has been interpreted as mere obstructionism, petulance and self-seeking by many otherwise neutral lay observers.

Medical Blue-Print Needed

To counteract that feeling and to answer the questions of intelligent men who have been aroused to interest everywhere, a medical blueprint for the future is greatly needed. In such a blue-print the gaps in our organization for public health would be clearly demonstrated. To close those gaps by strengthening the state departments of health and by encouraging the extension of health and sanitation units all over the country would be a logical first step in any realistic program for improving the health of the people. Public health and sanitation is acknowledged without question to be the function of the state. For the state or federal government to by-pass that fundamental responsibility and plunge direct into healing the sick—a function which does not belong either to government departments of health or social security, is both illogical and dangerous in the extreme. The medical men of the country should be the first to point it out, while rightly opposing the Wagner bill. But for the doctors to content themselves merely with opposition to this bill would be almost equally dangerous, in the face of the mounting public demand for a constructive, long-range plan. Inertia, coupled with opposition, is the surest way to provoke dangerous legislation.

Look to New Council

Fortunately the physicians now have a planning agency which is an integral part of the American Medical Association and responsive directly to the will of representative medical men throughout the country. This is the new Council on Medical Service and Public Relations established at the last delegates' meeting in Chicago. The new Council has the power and the mandate to fashion a constructive policy for medicine and it is ideally suited to meeting the urgent need for leadership today. It is the earnest hope of all forward-looking units of organized medicine that the new Council will carry forward the social and economic phases of medicine which have heretofore lagged behind its scientific achievements, in the difficult years ahead.

Action Demanded

The editorial entitled "The Time Is Now" which appeared in the November issue of the *Westchester* (New York) *Medical Bulletin* is good evidence of the general desire for a new public policy on the part of physicians. A part of the editorial follows:

> Our failure clearly to interpret ourselves, our accomplishments, and our sincere purpose to the American

people has rendered the art and science of American medicine exquisitely vulnerable to political manipulation by a bureaucracy seeking new ways of perpetuating its power. Furthermore, medicine's position of responsibility to the public places it at the mercy of political attack or envelopment.

What *can* be done, . . . what *must* be done, if we are to fulfill our fundamental obligation to the American people, and our responsibility to those who will follow us in our profession?

First, we *can,* even at this eleventh hour, *frankly and honestly tell our own story,* utilizing *in our own name* all the available means and media of modern public relations. If the American Medical Association must forfeit its tax-exempt status for the privilege of interpreting, not itself, but the medical profession to the American people (an assertion which we don't believe and hereby challenge)—then by all means let us buy our chips and get into the game! *Is it more important to the welfare of the American people for us to be exempt from taxes than from bureaucratic dictation?*

Second, we *can,* even at this eleventh hour, *establish an information and service bureau in Washington,* openly dedicated to the need of maintaining a continuous two-way channel of intercommunication between the medical profession and the people, the Federal agencies, and legislators who are interested in the services we render. The need for a Washington office for the American Medical Association is so obvious and urgent as to make any further delay in its establishment a matter of criminal negligence, in our opinion.

Third, we *can,* even at this eleventh hour, *assume our earned and rightful place of leadership* in the councils of those who seek to mould the future of our calling. We must certainly expect great and fundamental social changes; we will probably have to accept an increasing degree of proper governmental participation in medical service. But in any case, the profession must assert and maintain a definite status in the formulation of all legislation on health and medical matters. Merely to confer with governmental agencies cannot reasonably be construed as evidence that medicine has accepted their theories or philosophies concerning medical service. On the contrary, medicine owes it to the public, as it surely owes it to its own members, to assert its earned leadership in determining its own future.

The time is now!

Scientists are being asked to recommend persons who may be eligible for the 1943 Charles L. Mayer award of $2,000.

The award is offered for the most outstanding contribution made during 1943 to present-day knowledge of factors affecting the growth of animal cells, with particular reference to human cancer. The National Science Fund of the National Academy of Sciences administers the award.

Manuscripts and articles published during 1943 may be submitted to the committee any time before the middle of January, 1944.

Last year's award, the first to be given, was made to Dr. Charles Huggins of the University of Chicago for his work on endocrine control of prostatic cancer. —*Science News Letter,* November 27, 1943.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

J. F. Du Bois, M.D., Secretary

Roseau County District Court Issues Bench Warrant for Unlicensed Chiropractor

Re: State of Minnesota vs. Knute H. Luross, unlicensed.

On September 15, 1943, the Hon. Oscar R. Knutson, Judge of the District Court for the 14th Judicial District, issued a bench warrant at Roseau, Minnesota, for the arrest of Knute H. Luross, an unlicensed chiropractor, who had been ordered to appear before the Court to answer for alleged contempt of Court. Judge Knutson, in his order directed the Sheriff of Roseau County to apprehend the defendant and to hold him in custody unless the defendant furnished bail in the sum of $1,000. Before the Sheriff had an opportunity to serve the bench warrant, Luross left Roseau and has not been apprehended up to date.

The defendant has a long record of violating the healing laws of Minnesota. In March, 1936, he was tried and convicted by a jury of Polk County of practicing healing at Fosston, Minnesota, without a basic science certificate. He was sentenced to a term of 6 months in the Polk County Jail and the sentence was suspended by Judge Montague. Subsequently, Luross moved to Roseau, Minnesota, where he continued to engage in the practice of healing without a basic science certificate, and following an investigation made by the State Board of Chiropractic Examiners, the Court on April 9, 1942, made an order for judgment permanently restraining and enjoining Luross "from practicing healing in the State of Minnesota, including the practice of Chiropractic, until such time as he shall have been duly and regularly licensed to practice said healing in accordance with the laws of the State of Minnesota and until he shall have procured a certificate of registration in the basic sciences, and from advertising or in any way representing to the public that he is qualified or authorized to practice healing or to practice Chiropractic as defined by the laws of this State or from diagnosing, or attempting to diagnose, or treating, or attempting to treat, any of the diseases, maladies, afflictions or ailments of the human body."

On April 17, 1942, judgment was entered in accordance with Judge Knutson's order. In August, 1943, it was learned that Luross was again illegally engaged in the practice of healing at Roseau. The matter was again investigated by the State Board of Chiropractic Examiners, following which Judge Knutson ordered the defendant to appear in Court on September 15, 1943, to answer for alleged contempt of Court, the contempt being based upon the alleged violation of the Court's injunction issued in April, 1942.

The Minnesota State Board of Medical Examiners respectfully requests that anyone having knowledge of the defendant's whereabouts, promptly report the same to the Board.

White Bear Lake Woman Sentenced to 9 Months Imprisonment for Illegal Shipments of Abortion Paste

Re: United States of America vs. Anne M. Jenks.

On November 2, 1943, the Hon. M. M. Joyce, Judge of the United States District Court, sentenced Mrs. Anne M. Jenks, forty-three years of age, of White Bear Lake, Minnesota, to a term of nine months imprison-

ment in a penal institution and a fine of $200 for violating the Federal Food, Drug and Cosmetic Act. Mrs. Jenks was indicted by a Federal Grand July in Saint Paul, Minnesota, on June 29, 1943 on twenty counts for alleged violations of the above law. On September 11, 1943, Mrs. Jenks entered a plea of guilty to five counts of the indictment and the Court nolled the remaining counts. Mrs. Jenks is serving her sentence at the Women's Reformatory at Shakopee, Minnesota.

On January 19, 1943, the United States District Court, in an order signed by the Hon. Robert C. Bell, permanently enjoined Mrs. Jenks from shipping in interstate commerce a drug labeled "Intrauterine Paste" or "Dependon Products Paste" manufactured and sold by Mrs. Jenks at White Bear Lake, Minnesota. The injunction followed a lengthy trial in which the Government called forty-six witnesses, thirty-nine of whom were physicians. Six of the witnesses were confessed criminal abortionists. The Court, in its findings, held that the paste "is unsafe and dangerous to health and has caused fatalities and serious injury." The Court also found, as a matter of law, that the paste was misbranded and that the labeling was false and misleading. At the conclusion of the injunction suit Mrs. Jenks was fined $250 for contempt of Court and her husband, W. S. Jenks, was fined $500 for a similar offense growing out of the shipment of the paste to a Missouri physician after the Court had issued a temporary injunction on October 31, 1942.

Minneapolis Pharmacist Pays $200 Fine for Illegal Sale of Paregoric

Re: State of Minnesota vs. Bernice L. Murdock.

On November 5, 1943, Bernice L. Murdock, fifty-one years of age, proprietress of the Murdock Pharmacy, at 2451 Bloomington Avenue, Minneapolis, paid a fine of $200 in the District Court of Hennepin County, following her plea of guilty to an information charging her with the sale of paregoric without a medical prescription. The defendant was given her choice by the Hon. Frank E. Reed, Judge of the District Court, of paying the fine or serving six months in the Minneapolis Workhouse.

The defendant was arrested on October 29, 1943, following an investigation by the Federal Bureau of Narcotics. It was disclosed that the defendant had made ten sales of paregoric to one individual between August 27, 1943, and October 20, 1943, the sales totalling 52 ounces and no medical prescriptions having been issued by a duly licensed physician authorizing the sales. The defendant has a previous conviction in April, 1939, in the Municipal Court of Minneapolis, of selling liquor without a license. At that time she was fined $100 for selling liquor on fictitious prescriptions.

The Minnesota Legislature in 1941 amended the law so as to require a medical prescription for the sale of paregoric. Prior to that time paregoric was known as a so-called exempt preparation and pharmacists could lawfully sell not to exceed 2 ounces of paregoric within forty-eight hours for the use of one person, without a prescription.

License of Minneapolis Physician Revoked Following Conviction for Manslaughter

Re: State of Minnesota vs. Gustav D. Eisengraeber.

On November 5, 1943, following a hearing held before the Minnesota State Board of Medical Examiners, the license to practice medicine formerly held by Gustav D. Eisengraeber, M.D., 1406 W. Lake Street, Minneapolis, was revoked. Dr. Eisengraeber was charged with procuring, aiding and abetting a criminal abortion on a thirty-one-year-old, Minneapolis married woman who died on July 30, 1943, at St. Barnabas Hospital, Minneapolis.

On August 19, 1943, Dr. Eisengraeber was arrested on a criminal complaint charging him with the crime of manslaughter in the first degree in the same case, following a joint investigation by the Minneapolis Police Department, the Hennepin County Attorney's Office and the State Board of Medical Examiners. Dr. Eisengraeber waived a preliminary hearing in the Municipal Court of Minneapolis and, upon being arraigned in the District Court, entered a plea of not guilty, and was released upon cash bail of $5,000. His case was set for trial for September 13, 1943. It was subsequently continued, and on October 25, 1943, Dr. Eisengraeber withdrew his plea of not guilty and entered a plea of guilty before the Hon. E. A. Montgomery, Judge of the District Court. Judge Montgomery continued the case for one week and on November 2, 1943, sentenced Dr. Eisengraeber to a term of not to exceed ten years in a state penal institution, stayed execution of the sentence and placed Dr. Eisengraeber on probation for a period of five years. Judge Montgomery told Dr. Eisengraeber that if he violated any order of the Minnesota State Board of Medical Examiners with respect to a suspension or revocation of his license as a physician, it would be grounds for vacating the stay in the criminal case and Dr. Eisengraeber would have to serve his sentence.

Dr. Eisengraeber was born in Saint Paul, Minnesota, in 1886, and graduated from the University of Minnesota in 1912. Dr. Eisengraeber stated to the Court that prior to practicing medicine in Minnesota, he had practiced in Washington, Montana and Alaska.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Physicians Licensed November 5, 1943

October Examination

BACON, JOHN FREMONT, U. of Pa., M.D., 1942, 328 E. Henn. Ave., Minneapolis, Minn.

BLAKE, ALLAN JOHN, Marquette U., M.D., 1943, 42 15th Ave. N., Hopkins, Minn.

CAMERON, JOHN MINGE, Harvard U., M.D., 1942, Mayo Clinic, Rochester, Minn.

COLLINS, ROYDEN FRED, U. of Wis., M.D., 1942, 1663 Sherburne Ave., St. Paul, Minn.

CRONKITE, ALFRED EUGENE, Stanford U., M.D., 1938, Mayo Clinic, Rochester, Minn.

GEIST, SUSANNE, U. of Minn., M.B., 1942; M.D., 1943, 825 St. Clair Ave., St. Paul, Minn.

HAGEDORN, ALBERT BERNER, Stanford U., M.D., 1943, Mayo Clinic, Rochester, Minn.

HAINES, RICHARD DEWAYNE, U. of Rochester, M.D., 1942, Mayo Clinic, Rochester, Minn.

HALL, WILLIAM EVERETT, Marquette U., M.D., 1943, Miller Hospital, St. Paul, Minn.

HUSEBY, ROBERT ARTHUR, U. of Minn., M.B., 1943, University Hospital, Minneapolis, Minn.

HUTCHINS, SELWYN PERCIVAL RICE, U. of Texas, M.D., 1941, Mayo Clinic, Rochester, Minn.

IAMS, ALEXANDER MURDOCH, U. of Pa., M.D., 1942, Mayo Clinic, Rochester, Minn.

KLONTZ, CHARLES E., JR., U. of Ill., M.D., 1942, Mayo Clinic, Rochester, Minn.

LENZ, GILBERT GORDON, U. of Minn., M.B., 1943, Ancker Hospital, St. Paul, Minn.

LEVIN, LOUIS, U. of Cincinnati, M.D., 1941, Mayo Clinic, Rochester, Minn.

MCCLELLAN, JAMES THOMAS, U. of Okla., M.D., 1942, Mayo Clinic, Rochester, Minn.

MILLEN, FRANCIS JOSEPH, Marquette U., M.D., 1942, Mayo Clinic, Rochester, Minn.

OLIVER, JAMES, Northwestern, M.B., 1943, Ancker Hospital, St. Paul, Minn.

PETERSON, FLOYD RUSSEL, U. of Minn., M.B., 1943, St. Luke's Hospital, Duluth, Minn.

ROUSUCK, ASHER ASHLEY, Wayne U., M.D., 1940, Mayo Clinic, Rochester, Minn.

SBOROV, ABE MICHAEL, U. of Minn., M.B., 1943, Ancker Hospital, St. Paul, Minn.

STATE, DAVID, U. of Western Ontario, M.D., 1939, University Hospital, Minneapolis, Minn.

STEVENSON, MARGARET LYDIA, U. of Minn., M.B., 1942, 815 Superior St. S.E., Minneapolis, Minn.

STUELAND, A. J. RICHARD, Temple U., M.D., 1943, Ancker Hospital, St. Paul, Minn.

THOMAS, HENRY RANDALL, U. of Pa., M.D., 1939, Mayo Clinic, Rochester, Minn.

TOMPKINS, SOUTHER FULTON, Washington U. (Mo.), M.D., 1942, Mayo Clinic, Rochester, Minn.

WILLIAMSON, ROBERT JAMES DOUGLAS, U. of Toronto, M.D., 1940, Mayo Clinic, Rochester, Minn.

WILSON, HAL TRUAX, U. of Michigan, M.D., 1942, Mayo Clinic, Rochester, Minn.

WILSON, THOMAS REID, La. State U., M.D., 1941, Mayo Clinic, Rochester, Minn.

WOOD, WILBUR DONALD, U. of Minn., M.B., 1940; M.D., 1941, Mayo Clinic, Rochester, Minn.

By Reciprocity

DOUGLASS, BRUCE ECCLES, U. of Wis., M.D., 1942, Mayo Clinic, Rochester, Minn.

FAIR, ELLIS EDWIN, U. of Okla., M.D., 1941, Mayo Clinic, Rochester, Minn.

GRAHAM, RUSSELL BION, U. of Colo., M.D., 1942, Mayo Clinic, Rochester, Minn.

GUENTHER, THEODORE AUGUST, U. of Mich., M.D., 1940, Mayo Clinic, Rochester, Minn.

HENRY, EARL WILSON, JOHNS HOPKINS, M.D., 1940, Nopeming, Sanatorium, Nopeming, Minn.

KIRKLAND, WILLIAM GEORGE, HAHNEMANN MEDICAL College, (Pa.) M.D., 1938, Mayo Clinic, Rochester, Minn.

PEASE, GERTRUDE LORNA, CREIGHTON U., M.D., 1941, Mayo Clinic, Rochester, Minn.

REIF, HAROLD ALFRED, Wayne U., M.D., 1937, 1009 Nicollet Ave., Minneapolis, Minn.

RICKARD, ELSMERE RIFE, Northwestern, M.B., 1923; M.D., 1924, Minn. Dept. of Health, U. Campus, Minneapolis.

ROBSON, JOHN THEODORE, U. of Ore., M.D., 1942, Mayo Clinic, Rochester, Minn.

SPAR, ARTHUR AARON, U. of Neb., M.D., 1942, Mayo Clinic, Rochester, Minn.

By National Board Credentials

DETERLING, RALPH ALDEN, JR., Stanford U., M,D., 1942, Mayo Clinic, Rochester, Minn.

GENTRY, ROBERT WILTON, Harvard U., M.D., 1942, Mayo Clinic, Rochester, Minn.

HESKETT, ROBERT GLYNN, Harvard U., M.D., 1941, University Hospital, Ann Arbor, Mich.

JARBOE, JAMES PARRAN, Georgetown U., M.D., 1942, Mayo Clinic, Rochester, Minn.

MICKELSEN, EMMA FLORENCE, U. of Minn., M.B., 1937; M.D. 1938, 4390 Coolidge Ave., Minneapolis, Minn.

Communications

Minneapolis, Minnesota
October 15, 1943

To the Editor:

The conception that radiological services are something different from other medical services is, unfortunately, too widely held. Such a conception is well illustrated in the editorial "The A.H.A. and the A.M.A.," which appeared in the October issue of MINNESOTA MEDICINE. To those of us who are engaged in the training of young physicians to specialize in radiology, the implication that this specialty is different in character from other fields of medicine is particularly disturbing. To attract able men to a very important field it is imperative that no artificial distinctions which may impair the dignity or the independent status of the radiologist be instituted.

Regardless of the merits of the controversy as to whether medical services should be more widely distributed by various means, such as expansion of hospital service contracts or further entrance of the federal government into the health field, any consideration of such proposals on the part of the medical profession should have as their basis the assumption that what applies to one specialty will eventually apply to another. If we admit that radiology is a medical specialty and not simply a hospital service of a technical procedure, then we must treat this type of service in exactly the same way as we would any other type. For example, in the editorial referred to, the sixth paragraph could be rewritten to read as follows:

Surgical service, when needed, constitutes one of the expensive items for the sick. It is highly desirable from the patient's standpoint that its possible need should be included in a hospital service contract. Lowering the cost of illness is one of the aims of the medical profession. The hospital service organization does not determine the compensation of the employed surgical specialist but insures against hospital expense, which may include surgical service. Then the problem reverts to the proper method of compensating the surgeon serving the hospital.

What is wrong with this paragraph? The substitution of the word "surgeon" or "surgery" for "x-ray" makes it sound rather ominous to the average medical man. Why should it not be equally ominous if we use x-ray as used in the original editorial statement? Another quotation, in its original form, from the same editorial is of significance:

There may be some danger that hospital service organizations might attempt to expand the present provisions of their contracts to include more than diagnostic medical service. This, however, would constitute medical practice by a corporation, which is contrary to law.

Does this imply that diagnostic medical service is not medical practice and that the furnishing of diagnostic medical service by a corporation is not contrary to the

law? It is difficult to interpret the paragraph otherwise, yet it has been clearly established by the courts and by medical opinion that diagnostic medical practice by a corporation is against the law.

It may be granted at once that there is a serious problem in the dispensation of all types of medical services to patients. It may well be agreed, however, that the high cost of surgical service is a far more pressing problem, so far as most patients are concerned, than the high cost of x-ray service. That some means should be instituted to make it possible for the medical profession to lower the cost of illness is certainly desired by all, but that this should be done by making one or another group of specialists subservient to the hospital is an entirely different matter. It is possible that the fees for x-ray services in the private offices of radiologists may be higher than necessary. Many individuals feel that the fees of many internists are also too high, yet who amongst us would wish to determine what fees any particular physician should charge? Medical men need to give thought to the problems presented in the editorial. But in doing so they should look at them not from the point of view of the surgeon or the ophthalmologist or the internist but rather as a problem affecting the whole of medical practice, keeping clearly in mind that radiology is the practice of medicine and therefore should not be dispensed by corporations.

LEO G. RIGLER

San Francisco, California
October 29, 1943

To the Editor:

Your recent editorial in MINNESOTA MEDICINE has come to my attention. The implication seems to be that the House of Delegates of the American Medical Association did not quite know what they were about when they adopted some decisive resolutions this year regarding the advisability of hospitals furnishing medical services in Blue Cross Plans.

You observe that the "increase in the number of hospital service contracts . . . have doubtless brought to a head the question of the propriety or advisability of hospitals supplying the services of doctors. . . ." Permit me to point out to you that the problem is of over ten years' standing and has been tackled by many previous Houses of Delegates. The fact that a solution has not been achieved is just another indication of the extraordinary slowness of some of our processes in a democracy.

Hospitals *have* attempted to furnish a tonsillectomy along with the bed in some flat rate plans; others *have* furnished obstetrical services along with the bed in some obstetrical plans. These plans start with very noble motives but tend to develop into systems whereby a lay corporation, the hospital, sells a physician's services and sets the price on those services. When times get tough they may have to economize and then the only thing they can reduce is the quality or quantity of the medical service. Many of them end by hiring the physician on the basis of the salary he will accept rather than on the basis of his qualifications. For this reason, it is unwise for hospitals to attempt to furnish any physician's services along with and as a part of hospitalization.

* * *

A solution for the problem of including diagnostic medical services in group hospitalization plans might be the formulation of a joint "medical-hospital" policy. Only about five or ten cents in every hospital dollar is allocated to diagnostic medical services in the hospital. Let us say that ten cents of every new contract dollar is allocated to diagnostic medical services and paid directly to the patient, or the patient and the physician rendering the service. The other ninety cents can be retained by the hospital in the present manner. Instead of calling them hospital service contracts, you would call them hospital plus diagnostic medical service contracts. They could be administered jointly by groups of hospital administrators and physicians. They would cost the public no more and would involve less complicated bookkeeping than the present systems involve, less complaints and unhappiness on the part of far-seeing physicians.

Another solution might be for the hospitals to sell straight hospitalization insurance for perhaps one and one-half cents a day, a very cheap policy. Then, join that with some type of medical or surgical contract providing either catastrophic coverage or major hazard coverage. Most patients can indeed afford to pay a ten or fifteen dollar x-ray charge; the backbreaking part of a hospital visit is usually the two or three hundred dollar surgical charge. If Blue Cross Plans must sell some medical services along with hospitalization, why not make it a worth-while deductible policy similar to the catastrophic or major hazard automobile policy now in wide use? These deductible policies tend to police themselves and are not very expensive, yet widely sold.

Yours truly,

L. HENRY GARLAND, M.D.

P. S. Kansas City Blue Cross Plan has sold over 107,000 policies, *excluding* radiology.

Chicago, Illinois
October 25, 1943

To the Editor:

Your editorial "The A.H.A. and the A.M.A.," in MINNESOTA MEDICINE for October is provocative. I wonder if you realize that it is also self-contradictory?

In discussing the "propriety of hospitals furnishing the services of physicians such as those in charge of x-ray departments," you conclude that "a hospital, to be more than a hotel, must supply certain medical services."

I think a large portion of the medical profession would disagree. Apparently you also disagree when, in a later paragraph, you concede that the inclusion of radiology in hospital service plans may later lead to the inclusion of more than diagnostic medical service.

"This, however, would constitute medical practice by a corporation, which is contrary to law," you declare.

Are not diagnostic medical services, then, medical services? If it is unlawful for incorporated hospitals or service plans to practice medicine, how is it that you would permit them to practice radiology? If you would permit corporations to practice certain medical specialties, where would you draw the line, and how would you support your principle that corporate practice is unlawful and inimical to the public welfare?

* * *

Radiologists heartily approve of the principle of hospitalization insurance. They disapprove of hybrid plans, part hospital and part medical, under which the corporation guarantees to provide not only hospital service, but the services of certain physicians as well. They oppose the corporate practice of radiology for the same reason that internists oppose the corporate practice of internal medicine: such practice is contrary to the best interests of the patient.

More than half the approved Blue Cross Plans have acceded to the demands of the A.M.A. by confining their benefits to hospital services. These plans receive the support of the medical profession. It would be unfortunate if the plans which insist upon violating accepted principles of medicine by including certain medical services as benefits in kind took your editorial remarks as evidence of support from a divided profession.

Yours truly,
Mac F. Cahal
Executive Secretary
American College of Radiology

PROBLEMS ENCOUNTERED IN EXPLAINING CERTAIN CASES OF ERYTHROBLASTOSIS FETALIS ON THE Rh THEORY

(Continued from page 1059)

fertile one for further research and hopeful simplification.

Bibliography

1. Darrow, R. R.: Icterus gravis (erythroblastosis) neonatorum. Arch. Path., 25:378-417, 1938.
2. Fisk, R. T., and Ford, A. G.: Observations on the Rh agglutinogens of human blood. Am. J. Clin. Path., 12:545-552, 1942.
3. Landsteiner, Karl and Wiener, A. S.: An agglutinable factor in human blood recognized by immune sera for rhesus blood. Proc. Soc. Exper. Biol. & Med., 43:223-224, 1940.
4. Levine, P.: Isoimmunization in pregnancy and the pathogenesis of erythroblastosis fetalis. In Year Book of Pathology and Immunology, (1941) pp. 505-513. Chicago: Yearbook Publishers, 1942.
5. Levine, P.: On human anti-Rh sera and their importance in racial studies. Science, 96:452-453, 1942.
6. Levine, P.: Personal communication to author.
7. Levine, P., and Stetson, R. E.: An unusual case of intragroup agglutination. J.A.M.A., 113:126-127, 1939.
8. Levine, P.: Burnham, L., Katzin, E. M., and Vogen, P.: The role of isoimmunization in the pathogenesis of erythroblastosis fetalis. Am. J. Obst. & Gynec., 42:925-937, 1941.
9. Wiener, A. S.: Hemolytic transfusion reactions. Am. J. Clin. Path., 12:302-311, 1942.
10. Wiener, A. S.: Blood Groups and Transfusions. pp. 255. Baltimore: Chas. C. Thomas, 1943.

In Memoriam

OSCAR O. LARSEN

Dr. O. O. Larsen, well-known eye, ear, nose, and throat specialist of Detroit Lakes, Minnesota, died suddenly in his automobile, November 7, 1943.

Dr. Larsen was born in Saint Croix County, Wisconsin, August 6, 1877. He received his early education at Decorah, Iowa, and obtained his B.A. degree from Luther College before attending the medical school at the University of Minnesota, where he graduated in 1907.

From 1907 until 1913, Dr. Larsen practiced at Zumbrota, Minnesota, when he moved to Detroit Lakes and bought the Detroit Hospital, which was later sold to the St. Mary's Hospital Association.

For many years, he served on the Minnesota State Sanitary Conference and was its president in 1940. During World War I, he served as physician-surgeon member of the local draft board, and during the present war, he acted as specialist in the examination of rejectees.

Dr. Larsen was well known throughout the state as secretary of the Northern Minnesota Medical Association, in which capacity he served for eight years until elected president in 1937. He was also past secretary of the Clay-Becker County Medical Society, and at the time of his death was president. He was also a member of the Interprofessional Committee of the Minnesota State Medical Association.

Dr. Larsen was active in various capacities in the local Civic and Commerce Association, serving as president in 1941 and 1942. He was awarded the Silver Beaver Award in 1933, for his enthusiastic support of the Boy Scouts organization. He gave his generous support to the First Lutheran Church of Detroit Lakes. He also took a lively interest in hunting and fishing and the preservation of the natural playground afforded by the Northern Minnesota woods.

On December 22, 1903, he married Nora Herum of River Falls, Wisconsin. In addition to his widow, he is survived by four sons, Erling, Einar, Harold, and Adolph, and one daughter, Doris.

ALLAN BLANCHARD STEWART

Dr. A. B. Stewart, one of the outstanding surgeons of the state and a prominent citizen of Owatonna for fifty-two years, died at Rochester on October 30, 1943.

Dr. Stewart was born September 23, 1863, at Hume, New York. His early education was obtained at Ten Broeck Academy, Franklynville, New York, and at Genesco Normal College of Genesco, New York. Graduating from the University of Minnesota Medical School in 1891, he interned a few months at the Minneapolis General and the Saint Paul City (now Ancker) Hospitals and began practice in Owatonna that same year.

Elected mayor of Owatonna in 1897, he retired before

the completion of his term to go abroad for medical study in Edinburgh and Vienna.

A Captain in the Medical Reserve Corps at the outbreak of World War I, he was called to active duty in July, 1918, and was promoted to the rank of Major and placed in charge of the Medical Service of the United States General Hospital, Fort Snelling.

Dr. Stewart was a Master Mason and Past Master of the local Blue Lodge, a Past High Priest of the Chapter of Royal Arch Mason and a Past Commander of Knights Templar. He was a member of the Steele County Medical Society, the Minnesota State and American Medical Associations, and a member of the American College of Surgeons. On two occasions, he was president of the Southern Minnesota Medical Association. He was also a member of the Association of Railway Surgeons and an organizer of the local chapter of the American Red Cross. It was largely through the efforts of Dr. Stewart and the late Dr. Adair that the first Owatonna City Hospital was established.

On November 23, 1893, Dr. Stewart married Sidnie Ada Loomis of Owatonna. Thus their golden wedding anniversary was due in November of this year. Dr. Stewart had a long and useful career not only as a physician but as a citizen. His genial and understanding personality endeared him to a host of friends who will greatly miss him.

LOUIS BLANCHARD WILSON

The death of Dr. Louis Blanchard Wilson on Tuesday, October 5, 1943, at the age of seventy-six years, will be regretted by the medical profession of Minnesota, particularly on account of his past interest in state public health and his part in the affiliation of the Mayo Foundation with the University of Minnesota. His enthusiasm, diverse knowledge, vivid imagination and ability to speak in public made him a figure of attention at all medical gatherings. One recognized that he was a self-educated man who availed himself of many subjects of popular interest.

He was born in Pittsburgh, December 22, 1866, graduated at the Pennsylvania Normal School at the age of twenty years, taught biology in the Central High School of Saint Paul for ten years during which time he studied medicine at the University of Minnesota, his special interest being the new field of bacteriology. After graduation he became an assistant bacteriologist in the recently formed Minnesota State Board of Health, and assistant Professor of Pathology and Bacteriology at the University which had just established that department. This position he held under Professor Wesbrook until 1905 when Dr. William J. Mayo and his brother Charles invited him to join them in their reorganization of an enlarged private practice in Rochester, Minnesota, then a city of about 5,000 inhabitants. He succeeded Drs. Gertrude Booker and Isabella Herb who, under the direction of Dr. H. S. Plummer, had conducted all previous clinical laboratory procedures with the assistance of Daisy and Helen Berkman who did all routine blood and urine examinations. In a small room near the operating rooms he started a laboratory for the study of surgical specimens and adapted a method of staining microscopic sections for immediate diagnosis, which has been used with modifications ever since.

In 1915, with the creation of the Mayo Foundation for Graduate Medical Education and Research he became Director and remained in that position until his retirement in 1937. In 1918, he was commissioned a Major in the Museum Division of the United States Army medical service and served with the American Expeditionary Forces, collecting museum specimens of different types of wounds. He returned to the Mayo Foundation in 1919 and as Director had wide and diversified contact with the medical schools of this and other countries.

Dr. Wilson's variety of interests may be seen in the organizations to which he belonged which, besides medical societies, included the Advisory Board for Medical Specialists, the American Association for the Advancement of Science, the American Anatomists, the Association of Military Surgeons of the United States of America and the National Board of Medical Examiners, in some of which he was president. He belonged to Alpha Kappa Kappa, Alpha Omega Alpha and Sigma XI.

His early contributions to medical literature were upon bacteriological subjects in collaboration with Drs. C. E. Riggs, F. F. Wesbrook, O. McDaniel, F. L. Adair, C. L. Greene, J. L. Rothrock, G. D. Head, S. D. Brimhall, and William Chowning, whose names are well known in the early development of public health in the state of Minnesota. In the Mayo Clinic his contributions dealt with goiter, gastric cancer, diverticulitis of the colon, hypernephroma, and the application of photography to medical illustrating. Besides his medical interests he devoted much of his time to color photography, hunting, horticulture and ballistics. At all times he was an interesting and valuable citizen in his community and contributed much to popular interest.

Dr. Wilson was married three times, his first wife being Mary E. Stapleton who was his mate during his early high school teaching days, those in public health service, and the formative period of the Mayo Clinic in Rochester, Minnesota. She died June 4, 1919, leaving two children. On August 23, 1924, he married Maud H. Mellish of the editorial department of the Mayo Clinic. She died November 6, 1933 and on January 2, 1935, he married Grace G. McCormick, who survives him. He was buried with military honors in Rochester, October 7, 1943, leaving behind valuable memories to all who knew him well.

William Carpenter MacCarty, M.D.

The opportunity offered by routine x-ray or fluoroscopic chest examinations of adult admissions to general hospitals as a source of tuberculosis case finding has not been fully utilized. In a recent survey in a New York hospital tuberculosis was found in approximately 4 per cent of the patients. These cases would not otherwise have been detected. Of these 2.8 per cent had reinfection disease and 0.6 per cent had active or questionably active disease requiring hospitalization or close observation.—William C. Childress, M.D., et al., *J.A.M.A.*, Aug. 14, 1943.

Minneapolis Surgical Society

Meeting of October 7, 1943

President, H. O. McPheeters, M.D. in the Chair
Secretary, John M. Feeney, M.D.

INJURIES OF THE URINARY TRACT

THEODORE H. SWEETSER, M.D.
Minneapolis, Minnesota

It seems to me that there is a widespread failure to realize that surgical intervention is needed promptly in most types of injury of the urinary tract. There are perhaps three principal causes for this inclination to "wait and see." First, we know from experience that some 70 per cent of cases of nonpenetrating (subparietal) injuries of the kidney with hematuria will not need operative interference. That does not hold true for injuries of the ureter, bladder or urethra. Second, many of the patients with hematuria following injury have one or more serious and easily demonstrable injuries outside the urinary tract which at the time may completely occupy the surgeon's attention, unless he carefully looks for trouble in the urinary tract. Such other injuries include fractures and head injuries. I have seen several patients in consultation after their opportunity for recovery by urologic surgery had been allowed to pass, while their doctor had been occupied with the care of injuries outside the urinary tract. A third cause of delay has been the attempt to make an accurate diagnosis without adequate means. Some traditional diagnostic methods are notoriously misleading, and sometimes exploratory operation is safer than a prolonged diagnostic study. Intravenous urography has been a great help.

I am passing out to you copies of a more detailed summary of my understanding of these problems, as they are related to the different parts of the urinary tract. I wish now to show slides calling attention to some cases which will illustrate the problems presented.

Discussion

DR. WILLARD D. WHITE: Dr. Sweetser has covered very thoroughly the subject of injuries to the ureters, bladder and urethra. My part in this discussion is to consider certain injuries to the urinary tract that complicate fractures of the pelvis. Further, I wish to point out that there are certain types of pelvic fracture in which injury to the urinary tract are most apt to occur. The pelvis is a ring made up of the two innominate bones and the sacrum. The type of fracture of the pelvis in which injury to the urethra and bladder are most apt to occur are those cases in which there is any marked displacement. Fractures of the pelvis can be classified into two groups.

1. Single or isolated types in which there is little or no displacement are most apt to occur in the anterior part of the pelvic ring. These may include separation of the symphysis pubis or fracture of the superior or inferior ramus of the pubis usually on one side only.



Fig. 1. Boy sixteen years old recently hurt in an automobile accident (patient of Dr. F. Holzapfel). Cystogram made by intravenous urography shows filling defects due to clots and lacerations (one in left wall containing a loose fragment of bone), compression of the bladder from both sides by hematoma and extravasated urine, and the lack of definition of the upper outline of the bladder shadow of questionable cause. There were no physical signs of peritoneal involvement. Through a midline suprapubic incision: (1) the peritoneal cavity was explored; (2) the perivesical fluid and clots were removed; (3) the bladder was opened, the two lacerations sutured from the outside and the loose bone fragment removed; (4) a catheter was passed from the bladder through the urethra to demonstrate lack of injury of the deep urethra; and (5) the incision in the bladder was closed up to a size 45 French wing-tipped right angled cystostomy tube. The patient made a very good recovery.

2. Combined fractures in which there is apt to be fracture through the pubis in front together with a fracture through the posterior part of ilium or a separation of the sacro-iliac joint. In this group of cases one-half of the pelvis is displaced and it requires a

serious trauma to do this. It is in this type especially that bladder and urethra injuries are most apt to occur.

The third point I wish to make is that it is very important to determine as promptly as possible whether or not there is injury to the urinary tract, so that it can be dealt with appropriately if present. As soon as the condition of the patient will warrant, which means if shock does not prohibit the procedure, an intravenous pyelogram should be done and the films carefully examined for evidence of extravasation. This is more certain and more accurate than injecting the bladder and in my opinion is much safer.

The fourth point I wish to make is that where there is a displacement of one-half of the pevis this displacement should be corrected by placing the patient in a position of lateral recumbancy on a fracture table with a pelvic rest under the sound side of the pelvis. Then a plaster cast is applied around the trunk and down to the knees on both sides.

The next point and a very important one is that in these pelvic injuries I believe there is a great deal of advantage in securing the services of a competent urologist as promptly as possible. They have many tricks in controlling these difficult cases.

Dr. S. R. Maxeiner: We have had three patients in a comparatively few years who demonstrated the fact that the character of the urine determined the prognosis. One of these was a young man who had been drinking a good deal of beer and had a very full bladder when he fell across his abdomen, striking on an iron pipe. He sustained a rupture of the urinary bladder. I did not see this patient until twenty-four hours after the injury. He had a tremendous ascites due to extravasated urine within the abdominal cavity. He had been catheterized and because the urine emptied from the peritoneal cavity through the rent in the bladder it was not thought that he had sustained such an injury. I operated upon this patient, repaired the rent in his bladder, closed the peritoneum without drainage and his recovery was entirely uneventful.

Two other patients came to our attention, one of whom had a ruptured bladder following a cystoscopic examination in which the cystoscope accidentally punctured the bladder wall. This patient had a carcinoma of the bladder and the cystoscope had passed easily through the necrotic portion. The urine was badly infected. A laparotomy was performed and the rent in the bladder was closed. The uterus was used as a patch but this patient promptly died from peritonitis.

The third patient was a man in his early seventies from whom we had removed a large prostate suprapubically. He subsequently reported with a bladder full of pus, much frequency and a medium sized stone was found in the bladder. A urologist saw him in consultation and believed that the stone could be crushed and evacuated through the urethra. During the crushing operation the bladder was perforated. In this instance I opened the abdomen at once and found the peritoneal cavity contaminated with cloudy urine of a very purulent character. This patient succumbed from peritonitis within a few days.

Our experience is that a rupture of the bladder is not such a catastrophe if the urine is sterile but the outlook is extremely bad in the presence of a septic urinary bladder.

Dr. Sweetser: (closing) Intravenous urography is probably the most valuable test of injury of the urinary tract. It does require, however, that the systolic blood pressure be sufficiently high (above 80 mm.) to ensure excretion of the iodide. This may necessitate preliminary measures to overcome the initial shock, but it does not relieve one of the responsibility of promptness in treating that shock, and of promptness in making a diagnosis and undertaking adequate surgical treatment whenever it is indicated.

In answer to Dr. Nordland's question regarding a different subject, I can remember one patient whose bladder mucosa had apparently sloughed quite completely but who recovered with finally a good bladder capacity. I can remember one or two others in whom the final result was a bladder of very small capacity. The result depends on the depth of the infection in the bladder wall, and the amount of scarring.

HYPERPARATHYROID DISEASE DUE TO TUMOR OF THE PARATHYROID

CARL O. RICE, M.D.
Minneapolis, Minnesota

I wish to report a case of hyperparathyroid disease due to tumor of the parathyroid.

This is a history of a woman, aged forty-five. It was revealed that she became sick at least two years ago, at which time she was confined to the hospital because of a "nervous breakdown." At that time, she had been losing weight, was extremely nervous, had a gagging sensation in her throat, and occasionally vomited. She was scarcely able to stand up, and was totally unable to do her work. She also was very apprehensive with regard to people and could not tolerate association with others. She was on the verge of being confined to a mental institution, but after a week or two in the hospital, she made some improvement, and was again discharged to the care of her family.

These symptoms persisted in greater or less degree, and were associated with numerous other atypical complaints, many of which were considered to be neurotic in origin.

In November, 1941, she began to complain of arthritic pain. She stated that she had stiff and painful joints in almost all parts of her body. From time to time these arthritic pains migrated from one set of joints to another.

In May, 1942, she became extremely sensitive to heat or cold, was unable to tolerate the slightest breeze, and it was difficult for her to be comfortable in any type of weather. At about that time, she also noticed some bowing of her forearms, in that the curve of the ulna seemed to be much more prominent than was normal.

These symptoms became progressively worse up to the time of her admission in August 1942 to St. Barnabas Hospital where she entered as a patient of Dr. Albert Lundgren.

The history also revealed that she had been experiencing some nocturia, and diurnal frequency of urination for about a year. The day-night ratio was about 8 to 6. Recently her vision had become blurred and at times she mentioned headache.

At the time of her admission to St. Barnabas Hospital, she was acutely ill, appeared very weak, was extremely emaciated, and appeared to be manifestly a very poor risk for any type of treatment. She was nervous and respirations were gasping as if she had difficulty in breathing. In spite of these symptoms, she seemed mentally alert, and fortunately, was coöperative.

The physical examination revealed the frontal bosses presenting a peculiar prominence, suggestive of thickening of the skull. (The patient stated that "her hats had become too small in the past year.") The eyes, ears, nose, and throat were normal. There was a definite systolic and diastolic bruit over the thyroid gland. The thyroid was slightly enlarged, but was symmetrical and of normal consistency. In the right lower pole of the thyroid, there was a small, barely palpable mass, giving one the impression of an adenoma of the lower pole of the thyroid. The chest and lungs were normal. The pulse rate was 120 at rest, and the heart seemed a bit enlarged to percussion.

The abdomen was pendulous and out of proportion to the rest of the body. The abdominal muscles lacked

tonicity. There were no masses. The liver, kidneys, and spleen were not palpable.

There was a marked bilateral bowing of the forearms. It did not appear that this was an illusion based on her emaciation. There was sensitiveness on pressure over the long bones. There was an atrophic dermatitis over both feet. All reflexes were hyperactive.

The urine showed: specific gravity 1012, albumin trace (2 plus on one occasion), sugar, casts and red blood cells negative. Bence-Jones protein negative, Sulkowich test for calcium 1 to 2 plus.

Blood examination: hemoglobin 76 per cent, white blood cells and differential normal, blood calcium 16.6 mgm., blood phosphorus 6.8 mgm., phosphatase 52.3, total protein 5.5 mgm., urea 51.8 mgm.

X-ray examination of the skull, pelvis, lumbar spine, and many of the long bones revealed changes in the skull which would be compatible with a Paget's type of osteitis. The changes in her long bones were those seen in an osteitis fibrosa cystica.

On August 22, 1942, a biopsy was taken from the left clavicle. Two days later this clavicle fractured spontaneously. The histologic section of this biopsy revealed changes in the bone compatible with osteitis fibrosa cystica.

We were having trouble in accurately diagnosing this case because the blood calcium was high, and the blood phosphorus was also high. We had expected to find the blood calcium high, and the blood phosphorus low. We were unable to account for the elevated blood-urea-nitrogen. There was no demonstrable calicification in the kidney. Because of the elevation we were inclined to think that the blood phosphorus was probably forced upward instead of downward as should have been the case in hyperparathyroid disease.

In spite of the discrepancy in the laboratory findings, we made preoperative diagnosis of a parathyroid tumor in the right lower pole of the thyroid. She was operated upon on August 25, 1942, through the usual thyroid incision.

The thyroid appeared entirely normal throughout. Posterior to the right lower pole, was a brownish red mass, measuring 3.5x2x1.5 cm. in diameter. It was well encapsulated and extended into a recess in the posterior wall of the thyroid where a small indentation presented about the size of a normal parathyroid gland. The main mass of this tumor was definitely growing outside of the capsule of the thyroid.

The histologic sections of this tumor revealed it to be a parathyroid adenoma. Its structure was composed largely of chief cells, mixed with areas of large vesicular cells. The cells of the water clear type were not seen.

Postoperatively this patient almost immediately went into parathyroid tetany. This was first manifest by restlessness, nervousness, and later emesis.

On the day after operation, the blood calcium dropped to 7.3 mgms, and the blood phosphorus was 5.4 mgm. Four days after the operation, the blood calcium was 6.3 mgms. The Sulkowich test for calcium in the urine was negative two days after the operation. The hypoparathyroidism after the operation was controlled with the administration of 1 c.c. of parathormone for two days. Following this the patient was controlled with synthetic parathyroid extract the dosage depending upon the presence or absence of calcium in the urine.

The wound healed without complications. The patient left the hospital, having been advised to take calcium, vitamin D and synthetic parathyroid extract. She has continued to improve and today has gained weight and feels in perfect health. The bones have returned almost to normal in their x-ray appearance.

Discussion

Dr. R. C. Webb: This case report of Dr. Rice is very interesting and well worked up. I believe this is the second proven parathyroid tumor to be presented to this society. In my case which I presented here nine years ago the tumor was located at the lower pole of the right lobe, the same as in Dr. Rice's case. In my series of lantern slides, subtrochanteric fractures of both femurs were shown. The left femur showed considerable erosion of the femoral shaft also. From these x-rays a diagnosis of parathyroid tumor was made immediately, and I explored the neck nine days later. The delay was chiefly due to a slight indisposition of the patient and initial management of the fractures. X-rays of the ribs and of the humeri showed typical osteitis fibrosa cystica. The skull showed the ground glass appearance seen in Dr. Rice's x-rays.

After the tumor was removed by exposing the thyroid in the usual manner the patient was placed in bed with the lower extremities in suspension and skin traction. Skeletal traction was out of the question because of the softness of the bones. She was given a general diet with extra milk and cheese, but she was given no extra vitamins, and the final slide shows the two femurs well healed and the bones restored to normal appearance.

Osteitis fibrosa cystica was first described in 1891 by Von Recklinghausen and in 1904 Askanazy reported a parathyroid tumor found in a case of Von Recklinghausen's disease. Unfortunately, it was suggested that the osteitis fibrosa cystica caused the parathyroid hypertrophy. Numerous papers were subsequently written on osteitis fibrosa cystica without further reference to the parathyroids. Parathyroid tumors were searched for at necropsies, and their association with skeletal changes was noted in published reports.

In 1925 Mandl in Vienna had a patient with osteitis fibrosa cystica and followed the twenty-year-old theory that the bone disease caused the parathyroid hypertrophy and he transplanted parathyroids into his patient. When his patient grew worse he removed the transplanted parathyroids and also removed a parathyroid tumor and his patient recovered. Since then we all consider the possibility of hyperparathyroidism in all cases of abnormal mobilization of calcium such as in osteitis fibrosa cystica and nephrolithiasis.

SOAP AND WATER PREPARATION OF LACERATED WOUNDS

R. C. WEBB, M.D.
Minneapolis, Minnesota

Efficient treatment of lacerated wounds is of steadily increasing importance at this time, when the problem of manpower on the home front as well as the battle front is all-important. After the skin has been lacerated and the tissues have been exposed to contamination and infection it is the surgeon's problem to obtain healing by primary union if possible and to return the patient to duty as early as possible. In some parts of the world today the care of even minor wounds is taking preference over other less urgent surgical problems.

There is considerable variation in the treatment of freshly lacerated wounds. It would seem that such an old surgical problem would be by this time at least as well standardized as a thyroidectomy or an appendectomy, but such is not the case. Practitioners are being constantly urged to use different attractive and labor saving antiseptics which may account for the different methods used by them. Interns, however, are also found to have their different favorite antiseptics.

The use of soap and water on lacerated wounds is not new. Some years ago Dr. A. W. Abbott spoke before this society on "Surgery in Pre-Antiseptic Days,"

and he said, "Some of us obtained better results than others, and I think it may have been because our mothers differed." For many years soap and water was an important part of the preparation of operative fields and in some places it is still the only material used in skin preparation.

During World War I, Alexis Carrel was showing that soap and water treatment of healing wounds not only kept them sterile but also enabled them to heal in a normal manner following the Du Nuoy curve of normal healing. In recent years numerous surgeons have written advocating the use of soap and water in lacerated wounds and among these the contributions of Koch have been most effective and convincing.

Studies on the bacteriology of recently inflicted wounds with special reference to hemolytic streptococci and staphylococci have been recently made and published by Ronald Hare of the University of Toronto. Hare found that a very small percentage of wounds were contaminated with these organisms within two hours after injury. Many non-pathogenic organisms were found, hemolytic streptococci. Thus, later streptococcal infections of wounds are thus due to later introduction of organisms from some outside source, unless the injured himself happens to be a carrier. About 7 per cent of the population are reported as carriers of Group A hemolytic streptococci. Thus later, streptococcal infection of the wound comes from the nasopharynx of the injured, the first aid attendant, the surgeon and his assistants or in the case of hospital infections, from other patients.

Staphylococcal infections come from organisms present on the skin of the patient and from exogenous sources chiefly from unmasked nasal carriers who comprise from 30 to 40 per cent of the population.

As a result of Hare's studies it appears obvious that a wound should be immediately covered with a sterile dressing before the injured person or any one else has had a chance to contaminate the wound with organisms from his or her nasopharynx and that thereafter the patient and the attendants should wear masks over the mouth and nose whenever the wound is exposed.

We now come to the question of the method of treatment of the lacerated wound. The ideal procedure should be one which would convert it from a contaminated wound into a clean wound. There should be no argument as to whether or not this should be done at the earliest possible moment. A contaminated wound can become an infected wound within a very few hours and it is then unsafe to close the wound. Koch places this safe period at no longer than two to three hours.

There appears to be two methods in use for the conversion of contaminated wounds into clean wounds. One method in common use is that of applying tincture of iodine or some other so-called antiseptic which fixes, coagulates and destroys the delicate tissues under the skin and not only delays the healing process but also frequently furnishes a sticky covering over a nidus of infective organisms and thus aids in the development of infection.

Too often this treatment is carried out in a so-called emergency room, the equivalent of a surgeon's office with inadequate facilities and inadequate assistance and separated from the operating room suite. The lacerated wounds frequently involve tendons, nerves, bones and joints, and the technical difficulties are frequently the equivalent of operations elsewhere in the body. Appendectomies and cholecystectomies have been performed on kitchen tables, but such surgery is no longer advocated.

The other method is that of the soap and water method of converting a contaminated wound into a clean wound. We believe that this is the best available method and that it is the only method which should be used when any of the important subcutaneous structures require surgical care.

Some surgeons have suggested that the soap and water method is dangerous because it is too often inefficiently applied. Koch says that it is simple, requires only patience and care, requires no unusual surgical ability and that it works.

My only criticism of the soap and water method is that it is time-consuming when one attempts to use it in a hospital where the technique is unfamiliar. One needs adequate facilities and adequate assistance, and when the nursing staff has learned the technique one can proceed as rapidly as with any other surgical procedure of equal importance.

The difficulty lies in the fact that no surgeon ordinarily gets many important lacerated wounds; he struggles through the soap and water method with or without the use of additional antiseptics and sulfa drugs, and if he gets an indifferent result he forgets it by the time the next case appears and the process is then repeated with variations.

In many of the articles advocating the soap and water preparation of wounds the details of the method are either omitted entirely or are incompletely described. The result is that the operating room nurses are apt to be unaware of the surgeon's desires. The cases come in at odd hours; the operating room personnel is constantly changing and the nurses may not know what to expect.

We have prepared an operating room routine for such cases in order to correlate our own procedure and to give the nurses advance notice of what is wanted. We have found that once the operating room nurses are given this procedure in advance that both the surgeon and the nurses find the procedure simple, satisfactory and easy to apply, and the after-results prove that it works.

Operating Room Routine for Contaminated Wounds of the Hand, Wrist and Forearm

1. *A first setup of sterile green soap, brushes and irrigating solution for a five-minute scrub of skin, about the first aid dressing, from elbow to fingers and a manicure of the fingers. Masks over mouth and nose are worn by operating room personnel, and by the patient.*

The patient arrives in the operating room with a first aid dressing and perhaps a tourniquet on his arm. The tourniquet is removed and a blood pressure cuff is applied. If bleeding occurs the cuff is kept inflated to 250 mm. mercury as directed by the surgeon. The exposed skin of the fingers, hand and forearm is given a five-minute soap and water scrubbing and manicure of the

fingernails, by the nurse or intern, while the surgeon is scrubbing up. (The first aid dressing is not removed during this first step).

2. *A second fresh setup of sterile green soap, brushes and irrigating solution for a second five-minute scrub of the skin about a fresh sterile dressing.*

The surgeon removes the original first aid dressing at this time and examines the wound for bleeding, et cetera, and the blood pressure apparatus is inflated or deflated as indicated. A fresh sterile dressing is now applied to just cover the wound and is bandaged in place. The surgeon resumes scrubbing his hand and the nurse or intern gives a second five-minute soap and water scrub and irrigation to the exposed skin of the hand and forearm. Masks and gloves are worn.

3. *A third fresh setup of sterile white soap or neutral green soap, brushes, gauze and cotton pledgets, forceps and irrigating solution for a third five-minute scrub and irrigation of the skin about the exposed wound.*

The dressings are now entirely removed, and the hand is lying on a sterile towel on an arm board. The patient is given a general anaesthesia usually. Masks and gloves are worn, especially at this stage. The surgeon or his assistant scrubs the skin about the wound using brushes or gauze or cotton pledgets and sterile white soap, and the wound is continuously irrigated during this procedure to minimize or prevent additional contamination.

4. *A fourth fresh setup of sterile white soap or neutral green soap, irrigating solution, two bulb syringes, gauze sponges, cotton pledgets, instruments for handling gauze and cotton, and a small tray of instruments for debridement operation. The thoroughly scrubbed hand and forearm are placed on fresh sterile towels and draped.*

The patient is under anesthesia; a blood pressure cuff is on the arm, and the forearm is draped. The surgeon is scrubbed and masked and has on fresh sterile gown and gloves, and he now again irrigates the wound and may scrub the wound using sterile white soap and gauze pledgets in forceps. The surgeon then performs a "debridement" operation, excising the skin edges and devitalized underlying tissues and continues to irrigate the wound and surrounding skin.

The nurse supplies him with a small tray of instruments for the "debridement" operation, and she keeps herself and her larger instrument table uncontaminated.

5. *In case tendon, nerve, bone repair or other operation is necessary, a fifth setup of irrigating solution from a stand or with bulb syringes, cotton pledgets, and instruments, for irrigating the wound, and fresh gown and gloves for the surgeon. The wound is now draped for operation. The instrument nurse and instruments are ready.*

The surgeon now puts on fresh gloves and gown and proceeds with the necessary operation and the instrument nurse now assists in the usual manner as with a clean operation except that the irrigation is continued as indicated during the operation.

The use of a set of such directions for lacerated wounds of the hand in a private hospital serves as a basis for teaching the student nurses and it becomes easy to extend the technique to wounds elsewhere and to compound fractures. These directions may appear complicated and formidable at first glance, but parts one and two are no more time-consuming or detailed than the preoperative preparation for a simple laparotomy, and they are at least equally important to the patient. The third step is a continuation of the first two steps after an otherwise sufficiently wide clean field has been prepared. As a rule the surgeon wishes to carry out this final preparation of the skin. The fourth step now deals with the wound itself after the surrounding skin has been prepared and it is merely good housekeeping to have a fresh setup.

In the course of the debridement operation we are contaminating our gloves and our instruments while removing the contaminated parts of the wound. The fifth step is essential to good technique if delicate reconstructive work is to be carried out.

Several surgeons have expressed the opinion that if they themselves had a complicated wound that they would want all five steps meticulously followed but they doubt their ability to get their operating room forces to adopt such a complicated procedure.

However, the procedure is not as complicated as it appears on paper and when nurses have had experience with it they not only do not object, but they become advocates of the technique.

This discussion has been limited to fresh, recently lacerated wounds less than three hours old. The methods essentially as outlined here have been used by the writer satisfactorily since World War I. Since Pearl Harbor we have seen a greatly increased number of such cases and we are more than ever convinced of the use and value of the procedure. From an economic standpoint it is clearly seen that the time saved by the injured more than offsets the time and expense spent in the treatment. Also these patients recover in comfort.

Summary:

Lacerated wounds should be immediately covered by a sterile dressing snugly applied.

Protection of the wound against nasopharyngeal infections from the patient or from attendants should be provided constantly.

The wounds should be considered as emergencies and surgical treatment should be carried out within two hours.

Adequate facilities and adequate assistance are essential to proper care of such patients.

The soap and water preparation of lacerated wounds is simple and easy to apply and produces the most satisfactory results.

Discussion

Dr. Willard D. White: One of the important things in these cases is covering the nose and mouth with a mask. That statement is made frequently. Nevertheless it is not unusual to see a person in the operating room without a mask. He may be a spectator, perhaps a doctor who steps in for a minute or two, shows evidence of interest in the case, asks a few questions and makes comments. He is apt to get up close to the wound in order to see the details and if he talks without his face being covered there is an excellent chance that he is implanting a droplet infection into the wound. This point bears repeated emphasis. This very day I was operating on an injured hand. Everyone in the operating room had his face covered with a mask till one of my doctor friends came in and got quite close to the instrument table facing the direction of the wound and managed to say a few sentences before he was requested to get a

mask on. He apologized profusely and stated that he would be the first to complain if someone did the same thing while he was operating. It merely was a bit of carelessness but the consequences can be very serious and very important to the patient.

Dr. Webb has discussed his method of soap and water preparation. It does sound somewhat complicated. To me it is less so if instead of having five different basins, I use one basin with clear water and another one with soap and a pile of sterile sponges that are to be used for the scrubbing. With a sterile instrument a sponge is picked up and moistened in the basin. Soap is used with this. The sponge is discarded after using and the process is repeated. Doing it this way the basin is not contaminated by dipping into it because each time it is done with a sterile forceps. After this preliminary scrubbing an irrigator is used for further scrubbing in and around the wound. The debridement is done. The instruments used for this and the gloves used are discarded and a new sterile setup is used for the repair of tendons or other tissues requiring repair.

Dr. Carl O. Rice: I think this paper was splendid. One thing that has impressed me for a number of years, since the sulpha drugs have become popular, is that the use of these drugs in compound wounds and fractures has left doctors, and now soldiers, with a false impression, that if they throw in some sulphanilamide, they are safe from all infection. This is wrong. If those authors, dealing with the use of sulpha drugs in compound wounds, had titled their papers somewhat after the fashion of this dessertation, and then put in a paragraph or two relative to the supplementary use of sulpha drugs, I believe that we would have accomplished much more, in the care of compound wounds. I believe that the prime factor in the care of a compound wound is proper cleansing, and that the use of sulpha drugs in a wound is more or less supplementary.

Dr. S. R. Maxeiner: Wound irrigation added to the soap and water preparation we believe is extremely helpful in ridding the deep surfaces of contamination. Twice recently we have had the efficiency of wound irrigation proven to us. The first was a gunshot accident in which a boy of seventeen was shot in the buttock at very close range. There was a very large wound of entrance but no wound of exit. We did a very thorough soap and water cleansing, enlarged the wound of entrance and did a mechanical debridement. After the wound was as thoroughly clean as we could render it through this enlarged wound of entrance, we decided to make a counter opening on the opposite side of the leg. Irrigation was started through the counter opening and came out through the gunshot wound of entrance. To our great surprise two large gunshot wads, ¼ inch thick, made of felt to fit a 12 gauge shotgun, were washed out from the depth of the wound. These wads would never have been found nor removed except by irrigation and in this instance, through a counter opening.

Recently, at the beginning of the duck season a patient was brought to us who had had a gunshot wound of the forearm completely closed. He was hospitalized and the wound reopened. The muscles were badly contused and minced by the penetrating shot. Many of the muscles had the appearance of pheasant breast in which feathers have been carried into the tissues. During the process of debridement and irrigation, the fine bits of cloth and leather from his clothes which had penetrated with the shot were removed and again, a large shotgun felt wad was washed out by irrigation through a catheter.

We use sulfanilamide on these people only after thorough cleansing and debridement. I think Dr. Rice is correct in his statement. I know that the work of Dr. Webb has been very well received and is a splendid contribution to be considered at this time.

At Asbury Hospital we had a staff meeting given over entirely to the care of emergency cases which might arise in a major catastrophe. We attempted to adopt some type of standardization which would simplify care in the hospital if thirty to fifty emergency cases were suddenly brought in and cared for by perhaps twenty different methods. The surgical committee felt there should be some standardization adopted by the staff which would permit more efficient care of a large number of patients and the nurses and personnel would know what to do for burns, lacerations, head injuries, etc. A symposium was arranged at which time these standardized procedures were presented to the Asbury Hospital Staff and recommended for general use in a major catastrophe, no matter who was taking care of the patient. A suggested technique similar to that used by the navy at Mare Island was advocated for the use of burns. The soap and water cleansing was advocated for the treatment of lacerations and other standardized procedures were recommended for similar conditions.

Dr. R. C. Webb (closing): This set of directions for the soap and water preparation of lacerated wounds has been recommended by a committee to the staff of one of our hospitals and approved along with several other procedures recommended by other committees for use in case of a catastrophe here. The staff of course understands that this is only a minimum standard of careful technique and thoroughness and everyone is privileged to be more thorough and more careful.

The question of not cleaning more than a few inches about the wound has been raised. The initial first aid dressing is not removed at the beginning and the nurses scrub a wide area on both sides of the dressing. The wound is still protected and this wide cleansing is obviously not only not harmful, but it may be valuable in case one has to extend the incision to find a tendon for example. We want a wide area with plenty of clean skin and the area properly draped with sterile towels.

Brushes are used on the skin only, as a rule. Brushes are rarely used subcutaneously. Cotton pledgets are usually all that is necessary on the subcutaneous structures.

The use of sulfa drugs has been mentioned. Sulfa drugs are no doubt of value, but they should not be used as a substitute for careful technique. Sulfa drugs around a tendon repair produce excessive adhesion formation. We have been so impressed with the excessive adhesion formation in some of these wounds where sulfa drugs were used that we have considered putting sulfa drugs in wounds where good adhesions were wanted. Although we have never used the injection treatment for hernia repair we have been so influenced by the exponents of the injection treatment of hernia that we have sprinkled sulfanilamide crystals in a few hernia incisions while performing surgical repair, hoping thus to give the patient the advantage of both methods of treatment.

The value or necessity of the five sterile setups has been raised. If you are to use the soap and water method carefully and safely you must give the nurses assisting you a plan or they must learn your method the hard way. It is easier to give them such a plan ahead of time. If the surgeon finds that he can eliminate any part of the plan in any particular case, that of course is his privilege. It is readily seen for example that many cases will only require the first three setups.

I am glad that Dr. Merkert mentioned the importance of injecting local anesthetics through the skin at a distance from the wound. Local anesthesia should not be injected through these open wounds. We hope to get these wounds surgically sterile. By that we mean sterile enough so that the body can take care of any remaining organisms. A wound should be bacteriologically sterile before injecting local anesthetics through the exposed raw sides of the wound and risking the carrying of organisms with the needle into the surrounding tissues.

Minnesota Academy of Medicine

Meeting of October 13, 1943

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Minneapolis Club on Wednesday evening, October 13, 1943. Dinner was served at 7 o'clock and the meeting was called to order at 8:15 by the President, Dr. H. B. Zimmermann.

There were forty-seven members present.

Minutes of the May meeting were read by the Acting Secretary, Dr. A. C. Schulze, in the absence of Dr. Kenefick who is now in service.

Dr. Zimmermann announced that arrangements had been made with the Minneapolis Club and the Minnesota Club to hold alternate meetings in Minneapolis and St. Paul, providing the attendance did not run over 50 plates for dinners.

The scientific program followed.

ROENTGENOLOGIC OBSERVATION ON BRONCHIAL OCCLUSION

LEO RIGLER, M.D.
Minneapolis, Minnesota

Dr. Rigler, Chief of Department of Radiology of the University of Minnesota, read his Inaugural Thesis on the above subject.

DR. RIGLER: May I express my appreciation at being elected to this Academy. It is an honor which no Minnesotan would readily forego if he had the opportunity to attain it.

Abstract

Obstruction of the bronchi may produce such a multiformity of phenomena that adequate roentgen study is imperative for their demonstration. The character of the changes produced will depend upon the nature of the occluding mechanism, the rapidity of the obstruction, its duration, and the location—whether in the large or small bronchi. The occluding mechanism may be intrabronchial such as foreign bodies, tumors, constrictions of inflammatory origin, accumulation of bronchial secretion with the formation of mucous plugs, or extrabronchial, such as aneurysms, cardiac chamber enlargements, and mediastinal tumors. As a result of these various types of bronchial obstruction there may occur pulmonary emphysema, atelectasis, drowned lung, abscess, bronchiectasis. A complete roentgen examination may necessitate fluoroscopy, roentgenograms made in inspiration and expiration in the postero-anterior position, films in various other positions such as obliques, laterals, lordosis, supine, bronchography with iodized oil, and body section roentgenography. The addition of the latter two methods will enable the determination not only of the pathological process in the lungs which results from the obstruction but also accurate information as to the nature of the obstructive process. A review of cases will indicate the manner in which the various x-ray procedures are used and the detailed information which can be obtained. The possibilities of surgical treatment of the various types of bronchial obstruction make it imperative to utilize every means at our disposal for the accurate delineation of the pathological process.

Discussion

DR. R. G. ALLISON, Minneapolis: I would like to congratulate Dr. Rigler on his very able and comprehensive presentation of this very interesting subject.

I became interested in chest diagnosis some thirty years ago at Saranac Lake. It was my privilige to teach what I had learned at Saranac Lake to the late Dr. Willis Manges of Philadelphia who was the first radiologist to describe both atelectasis and obstructive emphysema in non-opaque foreign bodies in the air passages. Following Manges' observation, the literature became flooded with reports of tumors, malignant and benign, which produced the same findings.

Shortly after this, Forriestier in France developed lipiodol. Bronchograms then became the order of the day in cases where the diagnosis was doubtful. Development of the planagraph several years ago gave the radiologists another valuable ally.

I agree with Dr. Rigler that with the use of lipiodol and body section radiography, it is possible to recognize many minute tumors which remain beyond the reach of the bronchoscope. While bronchoscopy often gives us very positive biopsy evidence, I feel that too much reliance has been placed upon negative bronchoscopy.

I have seen many cases not diagnosed by the clinician until distant metastases appeared in spite of repeated positive x-ray findings.

DR. C. B. DRAKE, Saint Paul: Did the emphysema that was shown in these x-ray films disappear in many cases; was it just an acute form?

DR. RIGLER, in closing: Dr. Geer asked if I would like to make a distinction between a benign and malignant tumor of the bronchus on the basis of x-ray examination alone. I think it can be done without bronchoscopy, but I would like to have bronchoscopy for confirmation whenever possible.

The value of the biopsy in the distinction between carcinoma and adenoma and, in fact, in the demonstration of carcinoma of the bronchus goes without saying. Undoubtedly, it is the best evidence we can get. I hope I did not give the impression that x-ray examination was the only means of diagnosis. But when a patient comes in with a classical history, with or without physical findings, and with characteristic x-ray evidences of carcinoma, the chances of being right are extremely high, especially if bronchography has been done and a characteristic type of obstruction of the bronchus found. There is undoubtedly a small percentage of error, and some risks must be taken. On the other hand, if we must wait for bronchoscopic biopsy to be positive, we are going to miss the diagnosis in a considerable number of cases, particularly of course if the lesion is in the upper lobe. Some years ago I reviewed a hundred cases of carcinoma of the lung and found that the bronchoscopic findings were positive in but 20

per cent. Graham is disinclined to operate on patients with carcinoma of the lung unless they have a positive biopsy. In his institution they do as many as twenty or twenty-five bronchoscopies on one patient in the hopes of obtaining a positive biopsy. Nevertheless, I still believe that if we had to rely upon this always, the number of cases that would be available for surgery would be very small. The difference between an adenoma and a carcinoma, of course, is very difficult to decide, even after biopsy has been done. If one is certain that there is a tumor and if the clinical indications are such as to indicate surgery, I think it should be undertaken and the surgeon can determine at the time of exploration whether or not lobectomy or pneumonectomy should be done, depending on whether or not it is an adenoma or a carcinoma.

I think Dr. Geer misunderstood my reference to atelectasis. I was referring to the occurrence of atelectasis in bronchial asthma rather than in bronchiectasis. I think you do get atelectasis from time to time in bronchiectasis, but I am not at all certain that all of these acute attacks which bronchiectatic patients get are due to atelectasis. In bronchial asthma, however, I think the majority of attacks which are thought to be pneumonia can be proved to be atelectasis. In fact, I think some of the patients with bronchial asthma have as their final cause of death a massive atelectasis.

In answer to Dr. Drake, let me say that the acute emphysema such as I showed in cases of foreign bodies, or even in cases of bronchial asthma, will return to normal. Some years ago I saw a case of acute obstructive emphysema of one lung from a foreign body in a child which was so marked that it pushed the thymus away from the mediastinum well up into the chest. As soon as the foreign body was removed the emphysema disappeared and the thymus was restored to its normal position. Some of these emphysemas will remain for some period of time, having been recorded as persisting for several months. The longest one I have followed, which was the result of a foreign body, was about five weeks. When the foreign body is removed, the lung goes back to normal.

The meeting adjourned.

A. G. Schulze, M.D.
Acting Secretary

✦ Reports and Announcements ✦

AMA SCIENTIFIC EXHIBIT

The scientific exhibit at the Chicago session of the American Medical Association, June 12-16, 1944, will be held at the Palmer House. Exhibits will cover all phases of medicine and the medical sciences with particular emphasis on graduate medical instruction for the physician in general practice.

Application blanks for space in the scientific exhibit are now available and may be obtained by communicating with the Director, Scientific Exhibit, American Medical Association, 535 N. Dearborn Street, Chicago 10, Illinois.

AMERICAN BOARD OF OPHTHALMOLOGY

Examinations will be held by the American Board of Ophthalmology in New York City in June, 1944, and in Chicago in October, 1944. Applications for the June examinations must be filed by December 15, 1943, and those for the October examinations by April 1, 1944. All applications received after January 1, 1944, will be subject to the increased fee of $75.00. The Board headquarters are at 6830 Waterman Avenue, St. Louis, Missouri.

CONTINUATION COURSE IN OTOLARYNGOLOGY

The University of Minnesota Medical School, Division of Otolaryngology, announces its bi-annual Continuation Course in Otolaryngology February 7-11, 1944. This course is clinical and registration is limited to fifty physicians practicing otolaryngology as a specialty. The course will be conducted by members of the Graduate School Faculty of the University and the Mayo Foundation. A guest faculty will include Dr. Oscar Batson of Philadelphia, Dr. Paul Holinger and Dr. John Lindsay of Chicago, and Dr. Theodore Walsh of St. Louis. The tuition is $25.

Accommodations will be reserved for registrants in a Minneapolis hotel because the Center for Continuation Study is now occupied by men in military training. Early registration is desirable. Apply to Dr. W. A. O'Brien, Director Postgraduate Medical Education, University Hospital, Minneapolis, Minnesota.

MINNESOTA SOCIETY OF NEUROLOGY AND PSYCHIATRY

The regular dinner meeting of the Society was held at the Minneapolis Club, November 12, 1943.

The program included the following papers:

Acute Ascending (Landry's) Paralysis—J. C. Michael, M.D.

Healing of Brain Wounds—J. W. Kernohan, M.D.

Officers elected for the coming year are:

Walter P. Gardner, M.D., Saint Paul, president; James W. Kernohan, M.D., Rochester, vice president; Royal C. Gray, M.D., Minneapolis, secretary-treasurer.

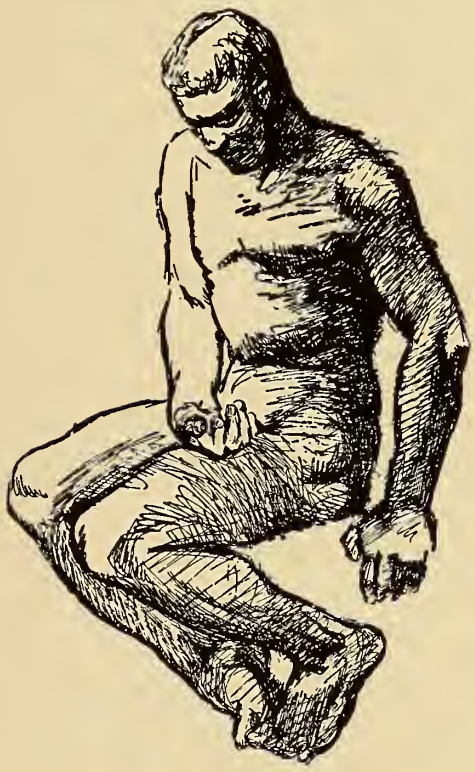
WASHINGTON COUNTY

The Washington County Medical Society held its monthly meeting on November 9, 1943.

The Stillwater doctors are planning to give the Mantoux test in the city schools to the pupils in the 7th and 8th grades because it has been discovered they have been exposed to an open case of tuberculosis.

The Sharp and Dohme Normal Human Plasma Film was presented as part of the program. Everyone present seemed to enjoy it, the film being highly instructive.

In the "Chronic Fatigue" of Mild Depression



After employing Benzedrine Sulfate therapy in a series of 40 patients diagnosed as suffering from nervous exhaustion, Nathanson concludes:

"In approximately 80 percent of the patients there was a marked amelioration of this symptom (fatigue). Many of the patients had complained of fatigue for long periods and had tried various types of treatment without benefit . . .

"A sense of increased energy and capacity for work was noted in more than half of the cases. In addition a feeling of exhilaration and sense of well being was a consistent effect . . . Many patients volunteered that there had been a definite increase in mental activity and efficiency." Nathanson, M. H.—J. A. M. A., 108:528, 1937.

Benzedrine Sulfate Tablets

Brand of racemic amphetamine sulfate

Benzedrine Sulfate is primarily useful in depressions characterized by apathy and psychomotor retardation, but is contraindicated in patients manifesting anxiety, hyperexcitability, or restlessness.

The use of Benzedrine Sulfate by normals should not be permitted; it should always be administered under the careful supervision of a physician; and depressive psychopathic cases should be institutionalized.

In treating depressed patients with Benzedrine Sulfate, the physician should bear in mind that any drug which produces pleasant or euphoric effects may prove to be habit forming—especially in unstable or neurotic individuals

SMITH, KLINE & FRENCH LABORATORIES
PHILADELPHIA, PA.



Nestlé's Milk Products
world's first choice
for babies!



No feeding directions furnished to the laity

WOMAN'S AUXILIARY

Mrs. F. S. McKinney, *President*
Minneapolis, Minnesota
Mrs. J. R. Aurelius, *Publicity Chairman*
Saint Paul, Minnesota

STATE NEWS

The year's activities of the State Medical Auxiliary began in earnest when the Board gathered at the Radisson Hotel, October 22, for the fall board meeting. A war service program was the topic for the session.

After the business meeting, at which Mrs. F. S. McKinney presided, the group were privileged to hear the members who are heading up the three major projects. Mrs. Claude Kennedy of Minneapolis explained the aims of the Medical and Surgical Relief Committee and urged all counties to assist in collecting discarded instruments and samples of drugs and other supplies.

Mrs. Harlow Hanson of Minneapolis outlined plans for the individual counties in aiding the emergency nursing committee and Mrs. Ivar Sivertsen, Minneapolis, chairman of the Speakers Bureau, presented the cadet nurse plan.

Mrs. Frederick H. K. Schaaf and Mrs. John Curtin of Minneapolis were in charge of the luncheon, after which Mrs. L. R. Boies of Hopkins and Miss Inez Hobart of the University of Minnesota discussed nutrition and canteen work.

RAMSEY COUNTY

The medical auxiliary opened its new season in October after a summer vacation from meetings for its membership. A lovely informal tea was held at the home of Mrs. Gordon Kamman of St. Paul. A rigid program of Red Cross work has and will continue to occupy members for the duration.

Honors were shared by the past presidents—Mrs. Lloyd Dack, Mrs. Harry Zimmerman, Mrs. A. G. Schulze, Mrs. Mark Ryan, and the new president, Mrs. Charles Waas, and State president, Mrs. F. S. McKinney.

NICOLLET-LE SUEUR

The Nicollet-Le Sueur auxiliary met with the counties' medical society at a dinner in October at the Burton Hotel in Mankato. Following the dinner, the women gathered at the home of Mrs. Hobart Johnson to hear a review of recent books by Dr. G. F. Petterson, professor of sociology at the Mankato Teachers College. Later in the evening the doctors rejoined their ladies for a social hour at the Johnson home.

HENNEPIN COUNTY

Thirty-one charter members of the original eighty-two members of the Hennepin County Medical Auxiliary were honored guests at a tea on October first at Mrs. A. E. Benjamin's home. Mrs. Harold Wahlquist, president, greeted the pioneers, after which the program was devoted to a review of the organization's 33 years of philanthropy, fraternity and health education. Mrs.

W. J. Byrnes, first president, elected October 10, 1910, gave reminiscences and told of the aims of the group which was the first medical auxiliary in the United States. Fashions of 1910 were worn by many of the members.

Mrs. F. S. McKinney and Mrs. John Curtin presented a little skit depicting two early members making their very elaborate preparations to attend a 1910 meeting.

At the November meeting the dentists' wives were honor guests to hear Gideon Seymour, editorial editor of the *Minneapolis Star-Journal,* speak.

Invitations were also sent to visiting doctors' wives whose husbands are in the service stationed at Fort Snelling, Wold Chamberlain Airport, and the University.

A Chinese Tea arranged by Mrs. Richard Lindquist completed the afternoon's entertainment.

On November 11, 12, and 13 the women of the auxiliary again sponsored the sale at the Dayton Company, of articles made by Glen Lake Sanitorium patients. Mrs. John Curtin was chairman of the sale and other auxiliary members acted as saleswomen. All proceeds are returned to the patients; this year's receipts totaled more than $2,000.

Plastic foil bags now hold fresh, cleaned green vegetables. The vegetables, all prepared for cooking, are protected from mold, germs, insects and moisture. These transparent bags are made of the same plastic as are warplane turrets.—*Science News Letter,* November 27, 1943.

Now Available

BIOLOGICAL REFRIGERATOR

Priorities for the manufacture of the "Victory Model" biological refrigerator have been granted in order to supply the demand for this compact, efficient, and thoroughly useful piece of equipment

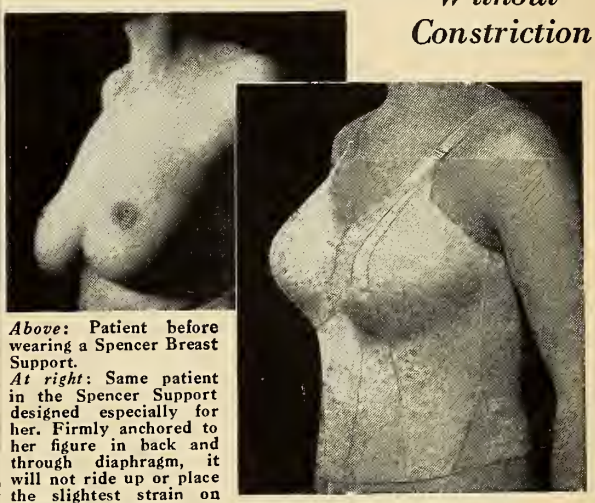
Essential in storage and preservation of biologicals, pharmaceutical products, and laboratory preparations requiring refrigerated temperatures.

For further information ask our salesman or write us for full details and descriptive literature.

BROWN & DAY, INC.
ST. PAUL, MINN.

DEFINITE UPLIFT FOR THE HEAVIEST PTOSED BREASTS!

This Spencer Support Holds Breasts in Natural Position Without Constriction



Above: Patient before wearing a Spencer Breast Support.
At right: Same patient in the Spencer Support designed especially for her. Firmly anchored to her figure in back and through diaphragm, it will not ride up or place the slightest strain on shoulder straps!

IMPROVES CIRCULATION of the blood through the breasts, lessening the chance of the formation of non-malignant nodules, and improving tone.

PROVIDES COMFORT AND AIDS BREATHING when worn by women who have large ptosed breasts.

AIDS MATERNITY PATIENTS by protecting inner tissues and helping prevent outer skin from stretching and breaking.

HELPS NURSING MOTHERS by guarding against caking and abscessing.

Individually designed for each patient.

Spencer Supports are never sold in stores. For a Spencer Specialist, look in telephone book under "Spencer Corsetiere" or write us direct.

SPENCER *INDIVIDUALLY DESIGNED*
Abdominal, Back and Breast Supports

SPENCER INCORPORATED,
137 Derby Ave., New Haven, Conn.
In Canada: Rock Island, Quebec.
In England: Spencer (Banbury) Ltd., Banbury, Oxon.

May We Send You Booklet?

Please send me booklet, "How Spencer Supports Aid the Doctor's Treatment."

.....M. D.

Address O-12

Of General Interest

Dr. W. W. Brown of Minneapolis is taking care of the practice of the late Dr. A. R. Johnson at Isanti.

* * *

Dr. V. I. Miller, who had been incapacitated because of illness, has resumed his practice at the Mankato Clinic.

* * *

Dr. B. T. Horton of Rochester was elected president of the Minnesota Society of Internal Medicine at the annual meeting held in Saint Paul.

* * *

Dr. C. A. Williams of Pipestone was elected president of the Southwestern Minnesota Medical Society at the annual meeting held at Worthington in November.

* * *

Dr. W. McKechnie, who has been a member of the staff of the St. Peter State Hospital for the past sixteen years, retired from practice on November 1.

* * *

Dr. Cecil J. Watson was elected president of the Central Society for Clinical Research at the November meeting of the Society.

* * *

Dr. Titus Kreuzer of Marshall has been appointed by the State Selective Service as a member of the Medical Advisory Board for southwestern Minnesota in the field of eye, ear, nose and throat diseases.

* * *

Major James J. Smith, M.C., of Saint Paul has been awarded the Legion of Merit at London for formulating an air-sea rescue system which has saved "A great number of lives of combat (air) crews."

* * *

Dr. Miland E. Knapp of Minneapolis, clinical assistant professor of Radiology and Physical Therapy at the University of Minnesota, is the new president-elect of the American Congress of Physical Therapy. He was elected to the office at the recent Chicago meeting.

* * *

Dr. Stanley B. Lindley, assistant superintendent of the Fergus Falls State Hospital for the past four years, has been appointed superintendent of the Willmar State Hospital, according to announcement received from Carl H. Swanson, director of state public institutions.

* * *

Dr. H. F. Krusen of Rochester has been appointed Director of the Branch Committee on Physical Medicine, with headquarters in New York City. The Committee will attempt to complete a survey to determine present needs in the field of physical medicine.



Radiation Therapy Institute



Control Board

of Saint Paul

CHARLES T. MILLER HOSPITAL

Facilities for Radium and Roentgen Therapy, Including Million Volt Constant Potential Installation of Most Advanced Design.

You are cordially invited to visit the Radiation Therapy Institute and inspect its facilities

Edward Schons, M.D., *Director* J. P. Medelman, M.D., *Associate Director*

Dr. Howard G. Johnson of Ortonville has moved to Bird Island where he has taken over the practice of Dr. L. D. Bushard, who recently became associated with Dr. Frank Burch in Saint Paul. Dr. Johnson will also be associated with the Rice Memorial Hospital at Willmar and will be associated there with Dr. R. J. Hodapp.

* * *

The businessmen of Grove City have purchased a residence in that village for the use of a resident physician. Dr. J. Y. Feinstein, who left Grove City to enter military service, is expected to resume practice in the near future, having received an honorable discharge because of his health.

* * *

Dr. G. A. Hedberg, Nopeming, Dr. D. A. Munro, Duluth, and Dr. R. E. Johnson, Crookston, were elected directors-at-large of the Minnesota Public Health Association at the annual meeting held in Saint Paul. Dr. F. E. Harrington of Minneapolis was elected president.

* * *

Lieutenant William W. Wood, Jr., M.C., USNR, is now in Australia. He was promoted to the commission of full lieutenant October 1. Lieutenant Wood is a graduate of the Class of 1937, University of Minnesota, and was a Fellow at the Mayo Clinic, Rochester, before entering the service.

* * *

Dr. M. Fording Fellows of Duluth has been promoted to the rank of Commander. He is serving with the Fleet Marine Force as Training Center Surgeon at Camp Joseph H. Pendleton, Oceanside, California. Dr. Fellows was a member of the Minnesota Naval Reserve before entering active service at the U. S. Naval Hospital at Bremerton Washington, in 1941. He was assigned to Camp Pendleton following duty aboard a heavy cruiser in the South Pacific area.

* * *

The Russian War Relief is making a plea for medical books for shipment to Russia to aid in the training of physicians. The list of books desired covers not only books on military medicine but those in the field of tuberculosis, pneumonia, dietetics, child psychiatry, stomach diseases, occupational therapy, psychology and mental hygiene. A few works on cattle and insect diseases also are desired. Books donated should be sent to Russian War Relief, 11 East 35th Street, New York 16, N. Y.

* * *

Word has been received that Major Maurice Walsh, M.C., A.U.S., is neuropsychiatric consultant of the 13th Air Force. To gain some practical experience, he accompanied bombing squadrons on several missions over Japanese territory. When on a recent mission the plane he was in was attacked by zeros. Splinters of a 20 mm. shell wounded the tail gunner and punctured Major Walsh's left foot. During the action Major Walsh cared for the tail gunner.

PROFESSIONAL PROTECTION

SINCE 1899
SPECIALIZED
SERVICE

In addition to our Professional Liability Policy for private practice we issue a special
MILITARY POLICY
to the profession in the Armed Forces at a
REDUCED PREMIUM

THE
MEDICAL PROTECTIVE COMPANY
OF
FORT WAYNE, INDIANA

Cook County Graduate School of Medicine

(In Affiliation with Cook County Hospital)
Incorporated not for profit

ANNOUNCES CONTINUOUS COURSES

SURGERY—Two Weeks' Intensive Course in Surgical Technique starting January 10, and every two weeks throughout the year.

MEDICINE—Courses to be announced in January.

GYNECOLOGY—Two Weeks' Intensive course starting February 7. Clinical Course.

OBSTETRICS—Two Weeks' Intensive Course starting February 21.

ANESTHESIA—One-Week Course in Continuous Caudal Anesthesia for Obstetrics.

OPHTHALMOLOGY—Clinical Course.

OTOLARYNGOLOGY—Special and Clinical Courses.

ROENTGENOLOGY—Courses in X-Ray Interpretation, Fluoroscopy, Deep X-Ray Therapy every week.

UROLOGY—Two Weeks' Course and One-Month Course available every two weeks.

CYSTOSCOPY—Ten-Day Practical Course every two weeks.

General, Intensive and Special Courses in All Branches of Medicine, Surgery and the Specialties.

TEACHING FACULTY — ATTENDING STAFF OF COOK COUNTY HOSPITAL

Address:
Registrar, 427 S. Honore St., Chicago 12, Ill.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

MONOGRAPH ON LYMPHOGRANULOMA VENEREUM. 32 pages. New York: E. R. Squibb & Sons, 1943.

Noteworthy contributions to the detection and differential diagnosis of lymphogranuloma venereum are those of Rake, McKee, and Shaffer, who have cultivated the agent in the yolk sac of the embryonated chicken's egg and obtained concentrated suspensions of elementary bodies. In this manner a highly purified and specific antigen, known as Lygranum S.T. has been prepared which is rapidly supplanting antigens prepared from either human pus or mouse brain. These workers alone, and in collaboration with Dr. A. W. Grace, have used the yolk sac antigen for the complement-fixation testing of serum of suspectedly infected patients. The specificity and sensitivity of this antigen (Lygranum C.F.) provides an additional means of detecting early cases of lymphogranuloma venereum.

In the course of investigations involving these tests, there accumulated at the Squibb Institute for Medical Research a considerable mass of information concerning the properties of the causative agent, the epidemiology and clinical aspects of the disease. To facilitate the work of investigators and teachers in this field, and perhaps to encourage the interest of potential inticing physicians and health officers, it was decided to compile and publish the information at hand. The result is a thirty-two page publication entitled Lymphogranuloma Venereum—a Monograph. The value of the book is enhanced by maps, charts and numerous illustrations in color.

The Monograph is available gratis to physicians and to public health officials, and will be a valuable addition to medical college libraries. Those who request copies should use their professional letterhead and address E. R. Squibb and Sons, 745 Fifth Avenue, New York 22, N. Y.

AN INTRODUCTION TO MEDICAL MYCOLOGY. By George M. Lewis, M.D., and Mary E. Hopper, M.S. Pp 342. 2nd ed. Price $6.50. Chicago: Yearbook, 1943.

The authors have produced something new—a work on mycosis, something that has been greatly needed, especially in the last twenty years. Investigations on this matter have progressed at a rapid pace and reports thereon have been voluminous. Previously, these reports were scattered through the different medical journals and to get anything worthwhile quite a hunt through the literature would have to be made. Now, all

(Continued on Page 1106)



Glenwood Hills Hospitals

3501 Golden Valley Road
Hyland Station
Route Seven

Part of the Grounds

•

Operated in Connection with Homewood Hospital

Plymouth at Penn Avenue, Minneapolis

•

FOR THE TREATMENT OF NON-SURGICAL AND NON-INFECTIOUS DISEASES—A modern hospital built on the cottage plan. The buildings are located on elevated land, affording beautiful views on all sides. Glenwood Hills Hospitals have all the advantages of rural surroundings, and are still only a few minutes by automobile from the Minneapolis loop.

AN INVITATION—The facilities of these institutions are available for all reputable members of the medical profession.



HOMEWOOD HOSPITAL is one of the Northwest's outstanding hospitals for the treatment of Nervous Disorders—equipped with all the essentials for rendering high grade service to patient and physician.

Operated in Connection with Glenwood Hills Hospitals

HOMEWOOD HOSPITAL

Corner Penn and Plymouth Avenues North
Minneapolis Minnesota

Social and Educational Adjustment

for exceptional children of all ages. Visit the school noted for its work in educational development and fitting such children for more normal living. Beautiful grounds. Home atmosphere. Separate buildings for boys and girls.

Catalog by request.

The MARY E. POGUE SCHOOL

124 GENEVA ROAD WHEATON, ILL.
(NEAR CHICAGO)

Send us your slow collection items.

All accounts made by personal calls.

We specialize in Medical and Dental Accounts.

Bonded and Licensed Under Minnesota State Laws

Northwestern Adjustment Co.

518 Bremer Arcade Bldg.
St. Paul Minnesota

this matter can be had in one volume, collected and written so that it is quite easily absorbed. This work is of value to both the clinician and the laboratory man. For the former there are a good many photographs on almost all types of mycosis, elaborating on the ordinary and treating also the rare. From these pictures one gets a clear idea of dermatosis mentioned, making it a little easier to recognize the condition. The differential diagnosis given in the book on the various conditions is quite good. The treatment is well handled, covering both drug therapy and radiation. As for the laboratory man, he can find a complete tabulation of most mycotic organisms encountered. The work is divided into a consideration of the superficial and the deep types. Also a complete clinical characteristic appearance of each is given. A considerable space is devoted to the laboratory methods, culture, et cetera for identification of the organisms.

All in all one cannot help but feel that dermatology has been greatly benefited by the introduction of this work and men doing dermatology as well as laboratory workers will find this most useful and valuable.

E. Z. Shapiro, M.D.

PICTORIAL HANDBOOK OF FRACTURE TREATMENT. By Edward L. Compere, M.D., F.A.C.S., and Sam W. Banks, M.D., 351 pp., 171 illus. Chicago: Year Book Publishers, Inc., 1943.

This book is written for the busy practitioner as a guide in treating the common injuries of bones and joints. Under the heading "General Considerations of Treatment of Fractures and Dislocations" are brief discussions of fracture pathology, fracture healing, diagnosis and emergency treatment, anesthesia, reduction, immobilization and general principles of care, compound and infected fractures, non-union, pathologic fractures, et cetera.

Fractures and dislocations of the various parts of the extremities and trunk are described with particular emphasis on treatment. Management of such injuries by methods which are simple and yet adequate is an important feature of this work. Highly technical procedures are omitted. Many of the illustrations consist of a series of diagrams, showing in detail the proper steps in reduction and immobilization.

This book is considered a valuable aid for the physician who is required to treat injuries of this nature.

R. J. Dittrich, M.D.

OUTLINE OF ROENTGEN DIAGNOSIS. Leo G. Rigler, M.D. 2nd ed. Price $6.50. Philadelphia: J. B. Lippincott Company. 1943.

The second edition of this very popular outline of roentgen diagnosis has now appeared five years after publication of the original edition showing a rather complete revision as dictated by the continual changes in the field of roentgen diagnosis.



VOCATIONAL HOSPITAL

Director of Nurses—M. H. WOLTMAN, R.N., B.S.
Superintendent & Dietitian—H. B. BROWN, B.S.

. . . An integral part of the Miller Vocational High School offers two special features—Patients receive a maximum of personal attention from student practical nurses—All food is prepared under the direction of a qualified dietitian. Patients remain under the care of their own physicians.

Physicians may secure services of Vocational nurses by calling Nurses Headquarters and asking for a Vocational Nurse

Bridgeport 2281

5511 South Lyndale - - Minneapolis

DANIELSON MEDICAL ARTS PHARMACY, INC.

PHONES:
ATLANTIC 3317
ATLANTIC 3318

10-14 Arcade, Medical Arts Building
825 Nicollet Avenue—Two Entrances—78 South Ninth Street
MINNEAPOLIS

HOURS:
WEEK DAYS—8 to 7
SUN. AND HOL.—10 TO 1

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.

414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.

INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS

MAIN 2494

To this second edition has been added discussion of the newer procedures of kymography, planigraphy or body section roentgenography, photofluorography, contrast cardiography and myelography as well as others. New disease entities and syndromes have evolved in this five-year period and have been included in the new text, notably the consideration of sarcoidosis, blood dyscrasias in childhood, hemophilia, renal rickets, coccidiosis, myocardial infarction, constrictive pericarditis and others. The atlas form of grouping the excellent figures and their legends has been retained as in the original text.

This new edition, so completely brought up to date, continues to be a most useful outline of roentgen diagnosis and is particularly valuable for students and teachers of roentgenology.

J. Richards Aurelius, M.D.

NEW CANCER CLINIC OPENED IN MEXICO

When a little girl broke open her piggy bank and took her whole treasure of carefully saved centavos to government officials to help build a projected cancer clinic, grown-up citizens of Guadalajara, Mexico, broke with the Mexican tradition of leaving it to the government to provide such community health facilities and contributed 32,000 pesos (about $6,400) for the clinic.

The story of the little girl was told to distinguished scientists when a new, finely equipped clinic was opened during the first Mexican Cancer Congress held in Guadalajara.

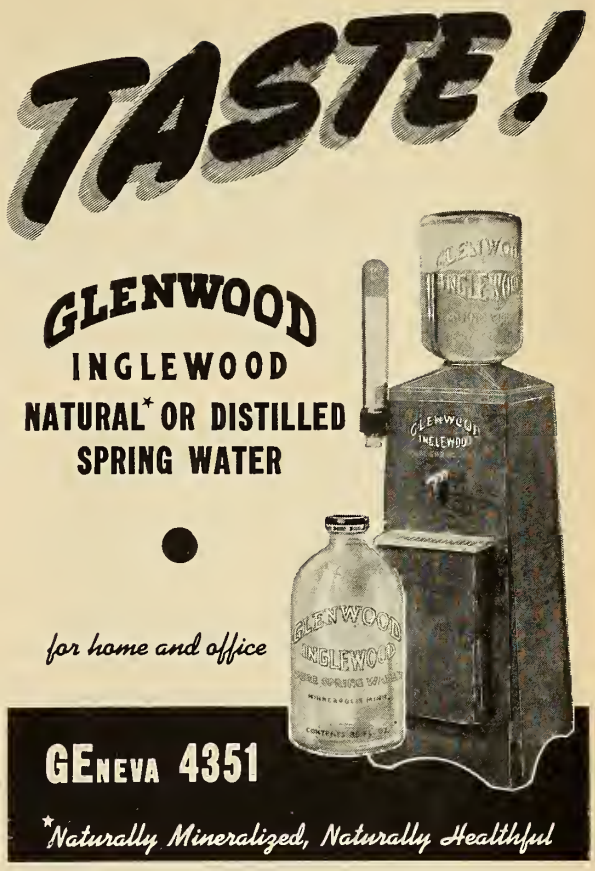
President Avila Camacha has asked that a National Institute of Cancer be organized in Mexico as soon as possible, Dr. Gustavo Baz, Minister of Health, announced at the congress which signalizes Mexico's declaration of war against cancer on a national scale.

An inter-American Institute of Cancer was visualized as a postwar possibility by Dr. R. R. Spencer, director of the U. S. National Cancer Institute, who was a speaker at the congress.—*Science News Letter,* November 20, 1943.



The Daily Log keeps complete records of income and expense. Because it's tailored to a physician's needs, it can save you *hours* of precious time. No special bookkeeping training required . . . used by thousands of physicians year after year. Fully recommended by medical authorities. Examine a copy yourself . . . $6.00 complete . . . *satisfaction guaranteed.* Or send for free literature . . .

COLWELL PUBLISHING CO., 226 University Ave., Champaign, Ill.



Accident, Hospital, Sickness
INSURANCE

For ethical practitioners exclusively
(57,000 Policies in Force)

$5,000.00 accidental death $25.00 weekly indemnity, accident and sickness	For **$32.00** per year
$10,000.00 accidental death $50.00 weekly, indemnity, accident and sickness	For **$64.00** per year
$15,000.00 accidental death $75.00 weekly indemnity, accident and sickness	For **$96.00** per year

ALSO HOSPITAL EXPENSE FOR MEMBERS, WIVES AND CHILDREN

41 years under the same management

$2,418,000.00 INVESTED ASSETS
$11,750,000.00 PAID FOR CLAIMS

$200,000 deposited with State of Nebraska for protection of our members.

Disability need not be incurred in line of duty—benefits from the beginning day of disability.

86c out of each $1.00 gross income used for members' benefit

PHYSICIANS CASUALTY ASSOCIATION
PHYSICIANS HEALTH ASSOCIATION
400 First National Bank Building OMAHA 2, NEBR.



REST HOSPITAL

A quiet, ethical hospital with therapeutic facilities for the diagnosis, care and treatment of Nervous and Medical cases. Invites coöperation of all reputable physicians who may supervise the treatment of their patients.

PSYCHIATRISTS IN CHARGE
Dr. Hewitt B. Hannah
Dr. Joel C. Hultkrans

2527 2nd Ave. S., Minneapolis, Phone At. 7369



The Birches Sanitarium, Inc.

2391 Woodland Avenue

Duluth, Minnesota

A hospital for the care and treatment of Nervous and Mental disorders. Quiet, cheerful environment. Specially trained personnel. Recreational and occupational therapy.

Psychiatrists in Charge

L. R. Gowan, M.D. **A. S. Nissen, M.D.**

✶ CLASSIFIED ADVERTISING ✶

YOUNG PHYSICIAN, Gentile, draft exempt, desires association with surgeon. Nonincapacitating exemption. Three years of general medicine and surgery with one year postgraduate work in pathology. Address D-67, care MINNESOTA MEDICINE.

* * *

FOR SALE—$18,000 practice. Town of 2400, Southern Minnesota. New modern, open hospital. Basal machine. Full line surgical instruments including new B.B. cystoscope. Laboratory including blood chemistry, Heidbrink gas machine. New 30 milliampere, built-in Bucky x-ray. Modern suite, six well furnished rooms. 160-volume library. Complete refracting equipment, including B & L refractoscope. Streak retinoscope, phoropter, et cetera. Overhead low. Will introduce. Address D-69, care MINNESOTA MEDICINE.

* * *

FOR SALE—Hospital equipment including Westinghouse late model x-ray tilt table, fluoroscope and Bucky, autoclave, portable O. R. light, gas machine, new operating table, beds, bedside tables, delivery table, and numerous other hospital items. Address D-65, care MINNESOTA MEDICINE.

FOR SALE: Kelleket shockproof x-ray machine, 30 ma., K90 with tilt table, automatic Bucky, complete darkroom accessories. Address D-70, care MINNESOTA MEDICINE.

* * *

TRAINED NURSE, aged forty-eight, wishes position in doctor's office; Twin Cities area preferred. Can operate typewriter and take dictation. Telephone Elkhurst 2248, Saint Paul.

* * *

WANTED—Technician, nurse or receptionist, or person with combination of these qualities for service in physician's office in small town in rural Minnesota. Address D-64, care MINNESOTA MEDICINE.

* * *

AVAILABLE IMMEDIATELY—Well established remunerative practice, small village, good community. Three-bed maternity hospital and office building for sale or rent. Address D-68, care MINNESOTA MEDICINE.

* * *

WANTED—Association with individual or group by doctor honorably discharged from Army service. State location, type of practice and salary. Address D-66, care MINNESOTA MEDICINE.

ZEMMER

Prescribe or Dispense Zemmer

Pharmaceuticals . . . Tablets, Lozenges, Ampoules, Capsules, Ointments, etc. Guaranteed reliable patency. Our products are labaratary contralled. Write far catalague.

Chemists to the Medical Profession MIN 12-43

THE ZEMMER COMPANY · Oakland Station · Pittsburgh 13, Pennsylvania

PHYSICIANS AND HOSPITALS SUPPLY CO., Inc.
414 SOUTH SIXTH ST., MINNEAPOLIS, MINN.
INSTRUMENTS · TRUSSES · EQUIPMENT · PHARMACEUTICALS · DRUGS
MAIN 2494

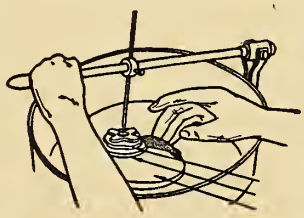
SAVE TIME!
TRY DAHL'S FIRST
Biologicals — Dressings
Pharmaceuticals — Surgical Instruments
Hypodermic Medications — Trusses
7:30 a.m. to 11 p.m.
Holidays, 9 a.m. to 11 p.m.
Joseph E. Dahl Co.
Incorporated
ATlantic 5445 — 82 So. 9th St., Mpls.

Radiological and Clinical
Assistance to Physicians
in this territory
MURPHY LABORATORIES
Minneapolis: 612 Wesley Temple Bldg. - - At. 4786
St. Paul: 348 Hamm Bldg. - - - - - - - Ce. 7125
If no answer, call - - - - - - - - - - Ne. 1291


Orthopedic Braces and Appliances
Physicians' specifications followed precisely.
Scientific manufacture and fitting.
AUGUST F. KROLL
Manufacturer
230 WEST KELLOGG BLVD.
St. Paul, Minn. — CE. 5330

Hall & Anderson
PRESCRIPTION PHARMACY
BIOLOGICALS
PHYSICIANS' SUPPLIES
SAINT PAUL, MINN.
LOWRY MEDICAL ARTS BUILDING
TELEPHONE: CEDAR 2735

The American
ECONOMY
Way
CHECKING SERVICE—AND REGULAR CHECKING ACCOUNTS
We offer you your choice of either of the above plans. Our officers will be glad to help you decide which is the cheapest and best suited to your needs.
FOR FULL INFORMATION
Please Call at the Bank or Phone CE. 0573
THE AMERICAN NATIONAL BANK
OF SAINT PAUL
BREMER ARCADE
7TH AT ROBERT
Member Federal Deposit Insurance Corporation

UNUSUAL LENS GRINDING

CATARACT, MYO-THIN and other difficult and complicated lenses are ground to extreme thinness and accuracy by our expert workmen.
ARTHUR F. WILLIAMS
SAINT PAUL
MINNESOTA

Save 25 to 40 Per Cent
Druggists' Mutual Insurance Company
OF IOWA, ALGONA, IOWA
Fire - Tornado - Automobile Insurance
Prompt Loss Service
Minneapolis Branch—S. E. STRUBLE, 835 Palace Bldg.
Home Office—Algona, Iowa



The Enchanted Ring . . .

Greatly prized among the Moors is a stone called **ain 1-horr.** *It is said that as long as a man wears this gem in a ring of gold he will beget no offspring.**

• An important phase of medical practice and public health programs today is instruction on child-spacing. When the physician advises deferment of pregnancy, modern methods enable him to make his counsel practicable. Ortho-Gynol Vaginal Jelly meets the most exacting requirements for a contraceptive preparation.

It immobilizes sperm instantly on contact, is well tolerated in continued use, stable and uniform in its properties. Ortho-Gynol Vaginal Jelly is widely prescribed in doctors' offices and clinics . . . a tribute not only to its effectiveness but to its acceptability among patients.

*Himes, *Medical History of Contraception*

COPYRIGHT 1943. ORTHO PRODUCTS, INC., LINDEN, N. J.

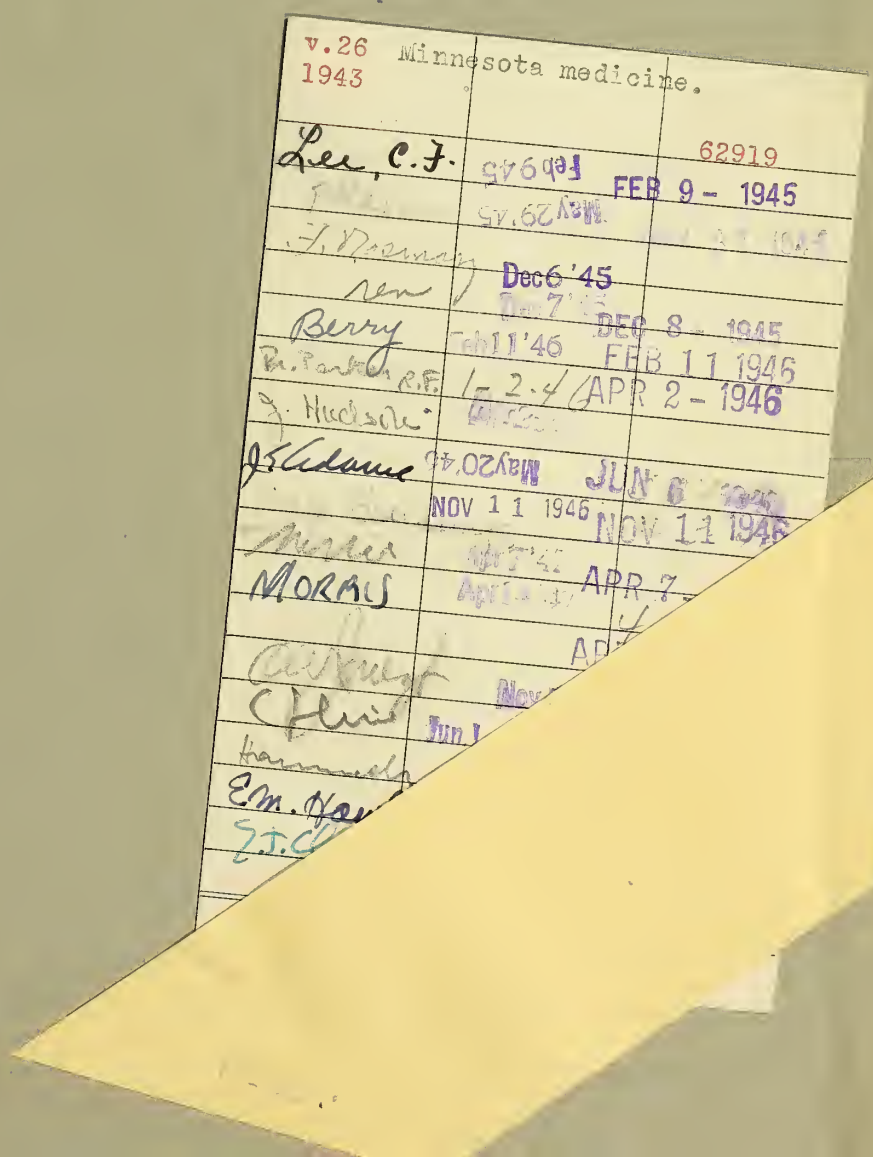
ACCEPTED AMERICAN MEDICAL ASSN Council on Pharmacy and Chemistry

ortho-gynol
VAGINAL JELLY

ACTIVE INGREDIENTS: RICINOLEIC ACID, BORIC ACID, OXYQUINOLINE SULFATE.

7 DAY
OCT 7 - 1976

RETURNED
OCT 6 1976
7 DAY
RETURNED
JUL 25 1977
7 DAY
OCT 6 - 1977
RETURNED
OCT -1 1977


v.26 Minnesota medicine.
1943
62919
Lee, C.F.
FEB 9 - 1945
Dec6'45
DEC 8 - 1945
Berry
Feb11'46 FEB 11 1946
APR 2 - 1946
JUN 6
NOV 11 1946
MORRIS
APR 7